Effective Health Care Program

Technical Brief
Number 18

Relationship Between Use of Quality Measures and Improved Outcomes in Serious Mental Illness

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Prepared by:
RTI –UNC Evidence-based Practice Center
Research Triangle Park, NC

Investigators:
Bradley Gaynes, M.D., M.P.H.
Carrie Brown, M.D., M.P.H.
Linda J. Lux, M.P.A.
Brian Sheitman, M.D.
Mahima Ashok, Ph.D.
Erin Boland, B.A.
Laura Morgan, M.A.
Tammeka Swinson-Evans, M.O.P.
Lynn Whitener, Ph.D.
Meera Viswanathan, Ph.D.

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This report is based on research conducted by the RTI International-University of North Carolina Evidence-based Practice Center (EPC) under contract to the Agency for Healthcare Research and Quality (AHRQ), Rockville, MD (Contract No. 290-2012-00008-I). The findings and conclusions in this document are those of the authors, who are responsible for its contents; the findings and conclusions do not necessarily represent the views of AHRQ. Therefore, no statement in this report should be construed as an official position of AHRQ or of the U.S. Department of Health and Human Services.

The information in this report is intended to help health care decisionmakers—patients and clinicians, health system leaders, and policymakers, among others—make well informed decisions and thereby improve the quality of health care services. This report is not intended to be a substitute for the application of clinical judgment. Anyone who makes decisions concerning the provision of clinical care should consider this report in the same way as any medical reference and in conjunction with all other pertinent information, i.e., in the context of available resources and circumstances presented by individual patients.

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Preface

The Agency for Healthcare Research and Quality (AHRQ), through its Evidence-based Practice Centers (EPCs), sponsors the development of evidence reports and technology assessments to assist public- and private-sector organizations in their efforts to improve the quality of health care in the United States. The reports and assessments provide organizations with comprehensive, science-based information on common, costly medical conditions and new health care technologies and strategies. The EPCs systematically review the relevant scientific literature on topics assigned to them by AHRQ and conduct additional analyses when appropriate prior to developing their reports and assessments.

This EPC evidence report is a Technical Brief. A Technical Brief is a rapid report, typically on an emerging medical technology, strategy or intervention. It provides an overview of key issues related to the intervention—for example, current indications, relevant patient populations and subgroups of interest, outcomes measured, and contextual factors that may affect decisions regarding the intervention. Although Technical Briefs generally focus on interventions for which there are limited published data and too few completed protocol-driven studies to support definitive conclusions, the decision to request a Technical Brief is not solely based on the availability of clinical studies. The goals of the Technical Brief are to provide an early objective description of the state of the science, a potential framework for assessing the applications and implications of the intervention, a summary of ongoing research, and information on future research needs. In particular, through the Technical Brief, AHRQ hopes to gain insight on the appropriate conceptual framework and critical issues that will inform future research.

AHRQ expects that the EPC evidence reports and technology assessments will inform individual health plans, providers, and purchasers as well as the health care system as a whole by providing important information to help improve health care quality.

We welcome comments on this Technical Brief. They may be sent by mail to the Task Order Officer named below at: Agency for Healthcare Research and Quality, 540 Gaither Road, Rockville, MD 20850, or by email to epc@ahrq.hhs.gov.

Richard Kronick, Ph.D.
Director
Agency for Healthcare Research and Quality

David Meyers, M.D.
Acting Director
Center for Evidence and Practice Improvement
Agency for Healthcare Research and Quality

Stephanie Chang, M.D., M.P.H.
Director, EPC Program
Center for Evidence and Practice Improvement
Agency for Healthcare Research and Quality

Carmen Kelly, Pharm.D, M.P.H., R.Ph.
and Aysegul Gozu, M.D., M.P.H.
Task Order Officers
Center for Evidence and Practice Improvement
Agency for Healthcare Research and Quality

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The authors deeply appreciate the considerable support, commitment, and contributions of the EPC team staff at the RTI–UNC EPC. We express our gratitude to the following individuals for their contributions to this project: Loraine Monroe, Sharon Barrell, M.A., and Laura Small, B.A., of RTI, and Rachael Posey, M.S.L.S., of UNC.

Key Informants (*also provided Peer Review)

In designing the study questions, the EPC consulted a panel of Key Informants who represent subject experts and end-users of research. Key Informant input can inform key issues related to the topic of the technical brief. Key Informants are not involved in the analysis of the evidence or the writing of the report. Therefore, in the end, study questions, design, methodological approaches and/or conclusions do not necessarily represent the views of individual Key Informants.

Key Informants must disclose any financial conflicts of interest greater than $10,000 and any other relevant business or professional conflicts of interest. Because of their role as end-users, individuals with potential conflicts may be retained. The TOO and the EPC work to balance, manage, or mitigate any conflicts of interest.

The list of Key Informants who participated in developing this report follows:

*Jeffrey A. Buck, Ph.D.
Centers for Medicare and Medicaid Services
Baltimore, MD

*Benjamin Druss, M.D., M.P.H.
Emory University
Atlanta, GA

*Laura Fochtmann, M.D.
Stony Brook University School of Medicine
Stony Brook, NY

*Amy Kilbourne, Ph.D., M.P.H.
VA Quality Enhancement Research Initiative (QUERI) and the
University of Michigan Health System
Ann Arbor, MI

*Kim T. Mueser, Ph. D.
Boston University
Boston, MA

*Steven S. Sharfstein, M.D.
Sheppard Pratt Health System
Baltimore, MD

Peer Reviewers

Prior to publication of the final evidence report, EPCs sought input from independent Peer Reviewers without financial conflicts of interest. However, the conclusions and synthesis of the scientific literature presented in this report does not necessarily represent the views of individual reviewers.

Peer Reviewers must disclose any financial conflicts of interest greater than $10,000 and any other relevant business or professional conflicts of interest. Because of their unique clinical or content expertise, individuals with potential non-financial conflicts may be retained. The TOO and the EPC work to balance, manage, or mitigate any potential non-financial conflicts of interest identified.

The list of Peer Reviewers follows:

Alisa Busch, M.D., M.S.
McLean Hospital
Belmont, MA
Harvard Medical School
Boston, MA

Lisa Dixon, M.D., M.P.H.
New York State Psychiatric Institute
Columbia University
New York, NY

Phillip Harvey, Ph.D.
University of Miami
Miami, FL

Robert Rosenheck, M.D.
Yale School of Medicine
New Haven, CT

Relationship Between Use of Quality Measures and Improved Outcomes in Serious Mental Illness

Structured Abstract

Background. Provisions of the Affordable Care Act (2010) require the use of validated quality measures (QMs) to evaluate the quality of health care programs, services, and outcomes. The need for such measures is crucial in serious mental illness (SMI), a long-term illness involving substantial functional impairment over multiple symptom domains that affects more than 11 million U.S. adults. Using QMs to assess the effect of programs designed to improve the mental health of SMI populations is an important task in improving the quality of these programs and services and, ultimately, health outcomes. Although stakeholders have proposed a variety of QMs, none are used consistently across all treatment sites or all forms of SMI. Key areas of uncertainty remain. Knowledge gaps for SMI include an agreed-upon list of relevant QMs; identification of the most meaningful outcomes by which to measure the success of QMs; identification of barriers to and facilitators of their implementation; and robust assessments of whether use of such measures improves medical, psychiatric, and patient-centered outcomes.

Purpose. The goal of this Technical Brief is to identify how QMs are currently used in the SMI population and to describe the evidence supporting their use.

Methods. We discussed with Key Informants and performed targeted searches of published and gray literature on questions of (1) a description of QMs; (2) the context for their use; (3) research linking QMs to changes in outcomes; and (4) current key issues in future uptake, use, evidence gaps, and research priorities.

Findings. The evidence base, which was sparse, suggests that no uniformly accepted practices exist on how to define or implement QMs for SMI, nor on which QMs are the most relevant. Outcomes against which to evaluate the effectiveness of QMs are difficult to measure. Time, the additional burden of using QMs on a resource-limited health care system, and a thin evidence base on their use were key barriers to implementation of QMs. Indeed, we found no prospective research evaluating whether the use of QMs for SMI leads to changes in outcomes. Of note, evidence does not exist that indicates that certain measures often used as proxies for quality of care actually measure quality of care or improve outcomes.

Conclusions. The literature does not indicate an agreed-upon list of preferred relevant QMs for the SMI population, and the outcomes against which to assess the effectiveness of QMs are challenging to measure. Relatedly, and possibly of greatest practical importance, no studies have assessed whether the use of QMs improves health outcomes for patients with SMI nor do stakeholders agree on preferred outcomes. Accordingly, critical issues for the field to address include (1) determining the level of evidence (or strength of evidence) necessary to support implementation of QMs, given the complexities of studying the topic and the likely limited research funding; (2) developing the evidence base that assesses the link between QM use and outcomes; (3) considering when to invest the time and resources on measuring outcomes of care to evaluate the impact of QMs, and when process measures (proxies of the outcomes) are a reasonable and more feasible alternative; (4) determining the resource needs for QM implementation; and (5) developing validated and reliable QM tools that can be implemented feasibly in real-world practice.

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Background

Prevalence, Morbidity, and Impact of Serious Mental Illness

Provisions of the Affordable Care Act (2010) require the use of validated quality measures (QMs) to evaluate the quality of health care programs, services, and outcomes.[1] The impetus for program evaluation stems from a desire to determine which programs are most effective for improving patient health. The need for efficient use of limited resources is crucial in serious mental illness (SMI), where adequate treatment requires long-term followup and places a heavy demand on often-strained health care resources. Encompassing a variety of definitions,[2] at its core SMI refers to a diagnosis of psychotic disorders, bipolar disorder, and major depressive disorder with psychotic features.

SMI is an important topic for several reasons. First, the prevalence and morbidity of SMI are striking. It is typically a long-term illness involving substantial functional impairment over multiple symptom domains. These impairments can lead to an inability to work, poor social relations, substance abuse, dangerous and reckless behaviors, repeated psychiatric hospitalizations, poor self-care, incarceration, and homelessness. Rates of SMI for U.S. adults range from 4 percent to 6 percent, affecting more than 11 million adults.[3,4]

Second, SMI and its comorbidities are frequently untreated or undertreated. Among adults with an SMI in 2008, less than 60 percent used any mental health services in the past year, and only 40 percent used any outpatient services.[5] Furthermore, even in those receiving treatment, the quality of care received for both psychiatric[6] and general medical conditions[7] is frequently inadequate, which may be related to poor outcomes. Indeed, SMI patients die 10 to 25 years earlier than patients without these illnesses, primarily from cardiovascular disorders.[8,9]

Finally, the costs of SMI to patients, families, and society at large are substantial. Many SMI patients require inpatient hospitalization at multiple times in their lives, and emergency department visits are not uncommon.[10] The cost of antipsychotic medications has typically been the single largest cost to most State pharmacy budgets.[11] The cost in terms of lost productivity is an estimated $193 billion per year in lost earnings.[12]

The Use of Quality Measures in Serious Mental Illness

One potential means of improving the delivery of quality care to SMI populations is using QMs as the agent of change. Quality of care is understood as "the degree to which health care services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge."[13] Accordingly, QMs can be defined as measures that allow the user to quantify the quality of a particular aspect of care by comparing it with an evidence-based criterion that specifies what constitutes better quality.[14] QMs are used for three general and often overlapping purposes: quality improvement, accountability, and research.[14] This brief focuses on the first purpose.

For patients with SMI, the use of QMs can serve different quality improvement purposes. Some QMs measure the quality of care for SMI: these measures may address global issues that span multiple psychiatric diseases (e.g., coexisting depressive symptoms) or more disease-specific ones (e.g., auditory hallucinations). Other QMs may treat the SMI population as a high-risk population for medical problems and thus require anchoring in values for general medical populations: the measures allow the user to assess whether care in a high-risk population is adequate relative to a comparable population without SMI.

To determine whether QMs are effective, they need to be evaluated against meaningful and measurable outcomes. For SMI, these outcomes include standard psychiatric outcomes, such as disease severity, response to treatment, and development of suicidal ideas or behaviors; medical outcomes, such as the development of cardiovascular complications; and patient-centered outcomes, such as employment, psychosocial functioning, and patient autonomy (i.e., outcomes especially meaningful to patients). These categories are not rigidly exclusive. Some may consider patient-centered outcomes as psychiatric outcomes, the goal of treatment not being merely symptom reduction but, more important, return to premorbid function and community engagement. Indeed, by their nature outcomes tend to be more patient centered. The most meaningful outcomes are those that clearly demonstrate improvement in health (e.g., resolution of psychotic symptoms, successful management of diabetes, maintenance of employment), but these can vary considerably by patient (e.g., some may value employment, others may not) and be challenging to measure. As a result, proxies for patient's health status, which really measure processes of care or service use, are sometimes considered outcomes.

By using QMs to monitor the degree and quality of care being delivered to the SMI population, policymakers, clinical providers, payers, and patient advocates hope to improve health care delivery by providing feedback on areas where quality care is not being delivered. For example, SMI patients may not receive guideline-concordant screening for medical illness, monitoring for antipsychotic side effects, or assessment of functional status/improvement; by identifying whether and where these care steps are missing, QMs can help health care providers identify where access needs to be increased and/or quality of care needs to be improved.

By improving access to and delivery of quality care, the use of QMs is one potential means of improving outcomes in SMI populations. Several international and national organizations have developed QMs and guidelines that may be suitable for SMI. In 2004, an international expert group developed consensus-based measures for the Organisation for Economic Co-operation and Development countries that address aspects of care for SMI.[15] In 2006, the Institute of Medicine described an approach for developing, testing, and validating QMs for mental health,[16] and two key organizations, the National Committee for Quality Assurance (NCQA) and the National Quality Forum (NQF), are involved in developing and endorsing QMs based on the Institute of Medicine recommendations. As QMs have been developed, groups have used RAND Delphi methods to try to strike the important balance between validity and feasibility.[17-19]

In keeping with this approach, NCQA develops measures or identifies any existing measure that appears appropriate for use as a QM. This determination confirms that the QM measures what it purports to measure, but an evidence base tying the presence of this QM to improved outcomes is not required. These are subsequently forwarded to the NQF for rigorous review. Measures that meet NQF review criteria (which include validity and feasibility) are then endorsed. Many measures are not endorsed because they lack sufficient evidence to support them. NQF has endorsed 16 measures that are applicable to SMI[20]; 6 are used by the Joint Commission as hospital-based inpatient psychiatric services measures[21] and 4 are Healthcare Effectiveness Data and Information Set measures[21] established by the Centers for Medicare & Medicaid Services for mental health care provided to Medicaid patients.

In addition, the Agency for Healthcare Quality and Research sponsors the National Quality Measure Clearinghouse (NQMC), a publicly available database and Web site for evidence-based health care QMs. Each measure that meets the rigorous NQMC criteria for inclusion has a structured, standardized summary detailing the evidence supporting the measure and other

background details, although this determination does not require direct evidence that the QM leads to improved outcome. The NQMC also incorporates the U.S. Department of Health and Human Services' Measure Inventory, a repository of measures used by their agencies for quality measurement, improvement, and reporting.

However, multiple potential constraints on the utility and adoption of QMs hinder their use as agents of change in the SMI population. A key consideration is the selection of a preferred outcome against which to assess the effectiveness of a QM. Although preferred outcomes may be longer-term and patient-centered, such outcomes can be challenging to measure routinely; therefore, many outcomes that are used are intermediate or proxy measures. Their use creates the possibility that improving the intermediate measure may not in fact improve patient outcomes. Indeed, there are a variety of opinions on which outcomes QMs should be assessed against, and whether these outcomes should be outcome measures or proxies for outcomes. Further, among SMI experts, the level of agreement about how to define a QM[22] is low. Specifically, a spectrum of views exists about which QMs should be applied; how to select the appropriate QM; how QMs should be developed, endorsed, and implemented; and how their use affects patient-relevant outcomes. The feasibility of QM implementation is unclear, given that the increased time and resource demand on heavily burdened providers may limit uptake. Not surprisingly, although a variety of such measures for SMI have been proposed, no single measure or metric is used consistently across all treatment sites (e.g., inpatient versus outpatient settings, community mental health versus private settings) or all forms of SMI.

Hence, key areas of uncertainty remain. Knowledge gaps for SMI include generating an agreed-upon list of relevant QMs; identifying the most meaningful outcomes by which to measure the success of QMs; identifying barriers to and facilitators of their implementation; and assessing robustly whether use of such measures improves medical, psychiatric, and patient-centered outcomes. The goal of this Technical Brief is to identify how QMs are currently used in the SMI population and to describe the evidence supporting their use. To reflect the variety of QM definitions and to help identify key potential future research needs in the field, we queried the Key Informants (KIs) on their understanding of how QMs should be measured and used. Our brief will examine (1) the measures, (2) their context, (3) ongoing research, and (4) future research directions and other issues.

Guiding Questions (GQs)

1. Describe Quality Measures (QMs)
    a. How should QMs be defined, identified, and implemented?
    b. Regarding outcomes against which QMs should be evaluated
        - What are the important psychiatric, medical, and patient-centered outcomes?
        - Should QMs be more strongly linked with fidelity to best practices *or* with outcomes?
    c. What are the different types of QMs currently used to assess quality of care and outcomes in patients with SMI?
    d. What factors affect the implementation of currently used QMs?
        - What are the potential advantages of each of these QMs in patients with SMI?
        - What are the potential disadvantages of each of these QMs in patients with SMI?
        - What are the barriers to their use?
        - What are the facilitators of the use of QMs?
    e. How useful are the currently available QMs?

- Are QMs currently being used for patient care and clinical decisionmaking?
- Are the correct QMs being used?
- What are the necessary steps to improve the use and usefulness of QMs?

f. How should QMs be used to measure outcomes over short-term, intermediate, and long-term periods?

2. Describe the Context in Which QMs for SMI Are Used
   a. What organizational components or characteristics of a hospital or other mental health care delivery facility affect selection of QMs?
   b. What clinical characteristics of the SMI diagnosis (e.g., schizophrenia vs. bipolar disorder) affect selection of QMs?
   c. What clinician characteristics (e.g., training, specialty, setting) affect selection of QMs?
   d. What nonclinical patient characteristics (e.g., sociodemographic characteristics, insurance status, urban/rural setting) affect selection of QMs?
   e. What resources (e.g., organizational structure, staffing, appointment availability) are needed to implement QMs?
3. Describe the Current Evidence on Whether the Use of QMs for SMI Affect Outcomes
4. Current Key Issues in Future Uptake, Use, Evidence Gaps, and Research Priorities for QMs
   a. What are the trends in uptake of QMs for SMI?
   b. What gaps exist in the evidence base for best practices or interventions for QMs for SMI?
   c. How should one prioritize the key areas for future research?
   d. What are the expected short-term developments in this field that may address these uncertainties or influence diffusion of QMs?
   e. What are potential long-term (10-year) developments in this field?

Methods

Systematic reviews require some certainty around definitional issues and a body of studies to advance understanding of important issues. Technical Briefs, by contrast, are appropriate products for nascent fields with large uncertainties around definitional issues and limited or no evidence, precisely because they focus on uncertainties in definition, context, and outcomes. A Technical Brief does not attempt to rate the risk of bias of individual studies or grade the strength of the evidence of the literature. The purpose of a Technical Brief is to provide an overview of key issues related to the intervention such as current indications, relevant patient populations and subgroups of interest, outcomes measured, and contextual factors that may affect decisions regarding the intervention. Technical Briefs integrate targeted searches of the published literature and gray literature (i.e., non-peer-reviewed material) on the nature, context, and future research directions of quality measure (QM) use for serious mental illness (SMI) (Guiding Questions [GQs] 1, 2, and 4) with discussions with Key Informants (KIs). We also conducted a comprehensive and systematic literature review to examine whether QMs improve outcomes (GQ 3).

Discussions With Key Informants

In consultation with our team and the Agency for Healthcare Research and Quality (AHRQ), we identified distinct perspectives that were needed to inform the development of a Technical Brief on this topic. Specifically, we sought to recruit the following as KIs: clinical providers, quality measurement implementation researchers, QM developers, QM endorsers, policymakers, patient advocates, and financing and reimbursement experts.

The KIs were particularly useful for shaping the Technical Brief because little empirical evidence exists about QMs available to assess the outcomes of serious mental illness. The KIs contributed to understanding the current state of the art of various QMs for SMI and to describe the evidence supporting their use.

The 11 KIs whom the Evidence-based Practice Center interviewed represented various fields of expertise related to outcomes of serious mental illness: clinical providers (n=2), quality measurement implementation researchers (n=4), QM developers (n=1), QM endorsers (n=2), policymakers (n=1), financing and reimbursement experts (n=2), and patient advocates (n=1). Some KIs represented multiple fields of expertise. More detail about the KI process is available in Appendix A.

Literature Review

Gray Literature Search

We searched the gray literature to identify information beyond the published literature on QMs in treatment of SMI. Sources for the gray literature included the following: HAPI, OpenSIGLE, ClinicalTrials.gov, Academic Search Complete, NIH RePORTER and ERIC. Appendix A provides a brief description of each of these sources. We also conducted targeted searches of Web sites of the National Guidelines Clearinghouse, the National Quality Measures Clearinghouse (NQMC), The Joint Commission, and the Center for Quality Assessment and Improvement in Mental Health(CQAIMH). See Appendix A for descriptions of these gray literature sources.

Published Literature Search

An experienced research librarian developed our search strategy (Appendix B). We systematically searched the published literature for information for GQ 3 from inception through August 13, 2014. We searched in PubMed (MEDLINE), Excerpta Medica (EMBASE), PsycINFO, and the Cochrane Library. We reviewed the reference lists of relevant papers, and we examined any literature suggested by KIs. Our research librarian also conducted systematic searches based on references suggested by KIs. We will update the literature review by repeating our searches concurrent with the peer review process.

Eligibility Criteria

Given the previously expressed concerns about the limited evidence base,[23] we carefully considered how best to define our eligibility criteria to both reflect the current state of the art on the current and potential future use of QMs in the SMI population (GQs 1, 2, and 4) while considering the current evidence base linking QMs to improved outcomes (GQ 3).

Accordingly, we developed slightly different criteria for these two sets of questions (Table 1 describes these criteria). For GQs 1, 2, and 4, to ensure that we captured the spectrum of current thinking and evidence for the area, we broadened our definition of SMI to include those studies likely to meet our SMI definition but which did not discretely identify psychiatric diagnoses that did not meet our SMI definition. Specifically, we elected to treat studies with undefined SMI or psychiatric hospitalization as inclusions: their likely inclusion of SMI populations of interest to us allowed us to cast a wider net. However, we excluded studies that clearly did not meet our SMI population definition. If the study populations clearly included diagnoses outside of our SMI definition (e.g., posttraumatic stress disorder or dementia) or clearly excluded our populations of interests (i.e., psychotic disorders, bipolar disorders, or major depressive disorder [MDD] with psychotic symptoms), we excluded those articles. Furthermore, we applied no study design restrictions because we anticipated that relevant information might come from a variety of publications, including review articles, qualitative research, and opinion pieces. Finally, we did not require articles to report on outcomes.

Using these broader criteria, we reviewed all abstracts for articles with potential relevance to GQs 1, 2, and 4. We obtained the full text of any abstract addressing one or more parts of these GQs. We reviewed the full-text articles using the same broader criteria, documenting reasons for exclusion or tagging the specific GQ that the article addressed.

We developed stricter eligibility criteria for our review of evidence on the effectiveness of QMs for SMI (GQ 3). For these studies, we required that the study population be of adults with SMI (schizophrenia or schizoaffective disorder [or other related primary psychotic disorder]; bipolar disorder; or MDD with psychotic features, per DSM-IV or their ICD-9-CM equivalent). Eligible interventions were those that employ QMs *or* interventions that examine how documentation (e.g., electronic health records) affects the use of QMs and were either head-to-head comparisons or compared with interventions that did not employ QMs. We required studies to address one of the specified outcomes of interest (see Table 1). Study designs eligible for GQ 3 included a wide range of designs from systematic reviews to pre-post studies (see Table 1), but case reports, case series, opinions, commentaries, letters to the editor, and nonsystematic reviews were excluded.

For GQ 3, two trained members of the research team independently reviewed all abstracts for eligibility based on the pre-established inclusion/exclusion criteria. Studies marked for possible

inclusion by either reviewer underwent full-text review. Any study with inadequate information in the abstract also underwent full-text review. We retrieved and reviewed the full text of all articles included during the title/abstract review phase. Two trained members of the research team independently reviewed each full-text article for inclusion or exclusion on the basis of the eligibility criteria. Disagreements about inclusion were resolved by discussion or consensus with review by the full research team as needed.

Table 1. Eligibility criteria

Criterion	Inclusion	Exclusion
Population	GQs 1, 2, and 4 ▪ ≥ 18 years ▪ with SMI (defined as a psychotic disorder, bipolar disorder, or MDD with psychotic features); or with serious and persistent mental illness (SPMI) but the specific psychiatric diagnose was not provided; or if SMI or SPMI is not specified but the patients had a psychiatric hospitalization.	GQs 1, 2, and 4 ▪ <18 years ▪ Study defines SMI or SPMI and clearly includes diagnoses not limited to one of the three included diagnoses: psychotic disorder, bipolar disorder, or MDD with psychotic features ▪ Study specifically excludes psychotic disorders or bipolar disorders ▪ Study focuses on PTSD, dementia, or inpatients with MDD (who are in acute crisis)
	GQ 3 ≥ 18 years with SMI currently or at any time during the past year (SMI defined as [1] schizophrenia or schizoaffective disorder [or other related primary psychotic disorder]; [2] bipolar disorder; or [3] MDD with psychotic features, per DSM-IV or their ICD-9-CM equivalent [and subsequent revisions]. Requires functional impairment that substantially interferes with or limits one or more major life activities.)	GQ 3 ▪ <18 years ▪ Primary diagnosis of substance abuse, dementia, personality disorder, or mental retardation without SMI
Intervention	All GQs ▪ Interventions that employ QMs or interventions that examine how documentation (e.g., electronic health records) affects the use of QMs.	All GQs ▪ Interventions that do not specify the use of QMs
Comparator	GQs 1, 2, and 4 ▪ No limitations GQ3 ▪ Interventions that meet eligibility criteria (for head-to-head comparisons) and do not employ QMs	GQs 1, 2, and 4 ▪ Not applicable GQ3 ▪ No comparison group
Outcomes	GQs 1, 2, and 4 ▪ No limitations GQ 3 ▪ Psychiatric outcomes: Intermediate outcomes (e.g., symptom improvement, remission, adherence, tolerability); long-term outcomes (length of time in remission, decreased morbidity and mortality from psychiatric diagnosis) ▪ Medical health outcomes: Intermediate; long term (e.g., decreased morbidity and mortality from medical illness) ▪ Patient-centered outcomes: Intermediate; long term ▪ Clinician standard of care (e.g., use of guidelines or evidence-based care) ▪ Changes in structure of health care delivery system (e.g., colocation of medical and psychiatric care) ▪ Adverse effects of using QMs	GQs 1, 2, and 4 ▪ Not applicable GQ 3 ▪ Outcomes not attributable to the QMs

Table 1. Eligibility criteria (continued)

Criterion	Inclusion	Exclusion
Timeframes	GQs 1, 2, and 4 ▪ No limitations GQ 3 ▪ Short term (≤ 6 months), intermediate term, and long term (≥12 months)	GQs 1, 2, and 4 ▪ Not applicable GQ3 ▪ None
Setting	All GQs ▪ Inpatient or outpatient, primary care or mental health (specialty) care	All GQs ▪ None
Study design	GQs 1, 2, and 4 ▪ No limitations GQ 3 ▪ Systematic reviews ▪ Randomized controlled trials ▪ Nonrandomized controlled trials ▪ Prospective and retrospective cohort studies ▪ Case-control studies ▪ Cross-sectional studies ▪ Pre-post studies	GQs 1, 2, and 4 ▪ Not applicable GQ 3 ▪ Case reports ▪ Case series ▪ Opinions ▪ Commentaries ▪ Nonsystematic reviews ▪ Letters to the editor with no primary data
Other	▪ English language	▪ Non-English language

Abbreviations: DSM-IV=Diagnostic and Statistical Manual of Mental Disorders, 4th Edition; GQ = Guiding Question; ICD-9-CM-International Classification of Diseases, Ninth Revision, Clinical Modification; MDD = major depressive disorder; PTSD = posttraumatic stress disorder; QM = quality measure; SMI = serious mental illness; SPMI = serious and persistent mental illness.

Data Management and Abstraction

All results were tracked in the EndNote database. We recorded the reason that each excluded full-text publication did not satisfy the eligibility criteria (Appendix C). We did not abstract data into a template because we did not identify any studies that met our inclusion criteria for GQ 3. If we identify eligible studies during our update search, we will abstract data from each included study using a standardized template, capturing the following information: author, year of publication, source of study funding, study design characteristics, study population (including study inclusion and exclusion criteria), interventions employing QMs, how documentation affects use of QMs, duration of patient followup, outcomes assessed (specific measures used, as well as timing of assessment), and other pertinent information. One member of the research team will collect the data, and a second team member will review them for accuracy and completeness.

We also compiled a list of QMs that have been identified for use in SMI populations. First, we accessed the five primary QMs databases (NQMC, CQAIMH, NQF, NCQA and the Joint Commission). We abstracted the following information: quality of care concern, type of SMI, the full QM, Developer, Evidence for the Measure, and Current Use. Second, for the QMs addressed in those studies identified in our literature search, we abstracted the following information: quality of care concern, type of SMI, Developer/User of Measure for Study, Data Source, and Study Details (Appendix D).

Findings

Because of the lack of certainty and consistency of definitions in this area, we attempted to identify the currently used definitions and concepts and to elicit input on future research and next steps in the field. Accordingly, as noted previously, for Guiding Questions (GQs) 1, 2, and 4, we looked beyond systematic and narrative reviews to qualitative research and opinion pieces. We elicited feedback from Key Informants (KIs) on what can be done and their ideas on what should be done. However, the findings from this Technical Brief should not be construed as making recommendations. It provides an early objective description of the state of science, a summary of ongoing research, information on future research needs, and suggestions of potential ways to advance the field.

Below, we focus on how the available literature addressed the GQs and integrate relevant key themes emphasized by the KIs.

GQ 1: Description of Quality Measures

GQ 1a: Defining, Identifying, and Implementing Quality Measures

We found limited evidence on defining and implementing QMs and considerably more evidence on identifying QMs. We did not find an agreed upon list of preferred and relevant QMs for the SMI population, a finding confirmed by our KIs.

Defining Quality Measures

No uniformly accepted definitions of QMs in SMI exist. Rather, QMs have a variety of definitions, primarily informed by the measure's role in a particular situation.[24-28] We found support for the use of Donabedian's Structure-Process-Outcome model for defining types of QMs in SMI.[29,30] Expert insight suggests that an important consideration in choosing among process- and outcome-based measures is that outcome-based measures for SMI that do not adjust for case-mix may lead providers to take on easier cases or penalize practices with more vulnerable populations, just as has been found in primary[31] and inpatient care.[32,33] The selection of process-based measures (which we refer to here as intermediate, or proxy, outcomes), on the other hand, requires that these process measures be clearly linked to clinical and functional outcomes. In other words, the scientific basis of the measure and its clinical importance are important considerations for defining QMs.[34]

The focus of this Technical Brief is on the relationship between use of QMs and improved outcomes. Accordingly, we carefully considered how best to apply Donabedian's model to the use of QMs. Given that the time and effort associated with wide dissemination, uptake, and maintenance of QMs necessitates that they reflect improved outcomes, not just improved structure or process, we emphasize the role of outcomes.

Identifying Quality Measures

QMs are currently identified through existing assessment systems, claims data, and toolkits. For instance, in one study, the authors derived mental health quality indicators by performing retrospective analysis on datasets containing assessments from the Resident Assessment Instrument Mental Health tool.[29] In another study of mental health rehabilitation services in England, researchers assessed quality of care using a Web-based toolkit, which includes seven domains of care for patients with complex mental health problems.[35] In the United States, studies

have used paid claims data to identify gaps in the care of SMI patients as well as to identify the extent to which patients receive evidence-based treatments.[36,37] One caveat to use of claims data is that many evidence-based treatments do not have specific billing codes that distinguish them from non-empirically supported interventions

QMs may be developed using a step-by-step process that may include a subset or all of the following steps: refining and agreeing on a definition of SMI; reviewing medical records, evidence-based practices and guidelines, measures, and/or quality improvement initiatives; developing concepts and measures (clarifying the numerator and the denominator) with expert panel contributions; and obtaining input from various key stakeholders;[34,38-44] and testing the measure on a dataset to determine feasibility and validity.

Although a number of QMs have been proposed for the SMI, the literature did not provide a consensus on which QMs should be used. KIs agreed that there was no such agreement on the most relevant or feasible QMs.

Sources for QMs include the following:

- AHRQ's National Quality Measure Clearinghouse (NQMC)[45]
- National Quality Forum (NQF), which reviews, endorses, and recommends performance measures[20]
- National Committee for Quality Assurance (NCQA)[21]
- The Joint Commission, an independent not-for-profit organization[46]
- Center for Quality Assessment and Improvement in Mental Health(CQAIMH) supported by AHRQ[49]

Implementing Quality Measures

Although we did not find direct evidence from literature on how QMs should be implemented, one study noted that large anticipated changes in reimbursement policies from a quantity-driven system to a quality-driven one will link payment to objective QMs.[47] Rapid change in the policy and reimbursement environment fuels the urgency of implementing QMs that are not redundant, inappropriate for or burdensome for SMI.[44] When organizations, such as the Centers for Medicare & Medicaid Services (CMS), mandate reporting of data for reimbursement purposes motivating providers to implement QMs becomes less of a concern. The link between implementing QMs and improving quality of care remains unclear.

GQ 1b: Important Outcomes Against Which QMs Are To Be Measured

Appendix D provides a compiled list of the QMs relevant to SMI care from both gray and published literature (empirical studies found during the GQ 3 search) sources. Potential outcomes against which QMs are to be measured are categorized as psychiatric, medical, or patient-centered. Mental health providers traditionally administer psychiatric outcome measures and assess the potential adverse events from psychiatric treatment. Medical outcomes generally assess health issues related to comorbid medical illness. Patient-centered outcomes reflect outcomes that often are of greater interest to patients and their families. These outcome categories are not completely distinct and may overlap at times but often can be seen as more likely representing a particular category. For example, level of functioning might be considered a psychiatric outcome as well as a patient outcome, but the patient or family may be more concerned with its measurement than the mental health provider.

As noted earlier, these outcomes—the ultimate goals for treatment—can be challenging to assess. Consequently, proxies for patient's health status (e.g., refills as a measure of adherence), that really evaluate *processes* of care or service use and are thought to be an *intermediate* step towards improved outcome, sometimes serve as outcomes against which QMs are evaluated. In the SMI population, more proxy (or process, or intermediate) measures are available, likely because they are more feasible and easier to collect. The likelihood of use varies somewhat by type of outcome.

For psychiatric outcomes, the literature primarily describes the use of proxies (see list below), with limited discussion of actual outcome measures. Also, the literature distinguished between psychiatric measures that measured either disease-specific (e.g., whether an antipsychotic was prescribed within the recommended dosage range for that disorder[30,43,48]) or more general processes of care (e.g., whether patient had outpatient mental health followup visit after hospital discharge).[20,21,34,36,38,42,45,49-51] Of note, while there are a number of approved general measures for MDD symptoms,[20] we did not identify any approved QMs that measure depression symptoms in patients specifically having MDD with psychotic symptoms (meeting our definition of SMI).

For medical outcomes, the literature (see bulleted list below) indicated that a number of intermediate outcomes (e.g., hemoglobin[Hg] A1c,[20,21,45,49,52,53] lipid values[30,37,38,45,52,53]) are commonly used. Not only are these readily available intermediate proxies more easily measured than psychiatric outcomes, they are also more easily measured than many patient-centered outcomes.

Patient-centered outcomes, which by their nature tend to be more outcome- than proxy-focused, are believed to be the most important.[23] These outcomes include engagement, recovery, personal empowerment, tolerance of treatments, functional measures, and quality of life measures. These measures involve both inpatient and outpatient treatment, unless they are specified otherwise (e.g., only inpatient).

Assessing these patient-centered outcomes represents a significant time and resource challenge, and may be especially difficult to improve in severe SMI groups, so using them to assess the effectiveness of QMs may be difficult and carry unintended consequences. KIs offered insight into this issue. They suggested that linking QMs to best practices or outcomes depends on context. Generally, evaluating change in outcomes is of primary importance. However, focusing on outcomes and incentivizing providers based on whether those outcomes demonstrably improve may result, for example, in penalizing providers for working with more challenging cases and holding providers accountable for downstream outcomes over which they may have little control (e.g., employment, housing). KI input suggested that in such situations, process measures such as fidelity to best practices or well-established treatment guidelines (for example, the schizophrenia guidelines)[54] may be preferable.

Psychiatric Outcomes

Global Outcomes

Studies report the following global psychiatric outcomes as important to assess for patients with SMI:

- Global Outcomes
  - Assessment of coexisting depression or anxiety symptoms[20,40,45,49]
  - Functional assessment[20,49]

- Global Proxy Measures (Intermediate outcomes)
  - Monitoring for side effects from psychotropic medications[35,40,42,49]
  - Assessment of medication use:[37,49] number of psychotropic medications prescribed (to assess risk for polypharmacy),[20,34,45,46,49] adherence to medications[20,21,37,38,49]
  - Prescription of antidepressant or antianxiety medications for identified comorbid depression or anxiety,[44,45,49] and assessment for trauma history[42,45,46]
  - Screening for risk of suicide[20,42,45,46,49] and violence toward others[45,46]
  - Screening for co-occurring substance use[20,30,34,40,42,45,49,53] and receipt of outpatient substance abuse treatment after hospital discharge[30]
  - Episodes/hours of seclusion or physical restraint while hospitalized
    Care after hospital discharge: continuing care plan,[20,45,46] care plan provided to the next level of care clinician or entity,[20,34,45,46] agreed upon comprehensive care plans between patients their family or caregivers as appropriate,[34,35,45] outpatient mental health followup visits after discharge from a psychiatric hospitalization,[20,21,34,36,38,42,45,49-51]; rehospitalization rates,[39,40,47] relapse monitoring plans,[40,49] monitoring of patients lost to followup[39]
  - Referral to case management[38,40,53] or Assertive Community Treatment team,[37,38,49,55] as indicated

Specific Outcomes

For patients with *schizophrenia*, studies suggested the following additional outcomes:

- Specific Outcomes
  - Percentage of individuals with first-episode psychosis detected within 6 months of onset of psychotic symptoms.[40]
- Specific Proxy Measures (Intermediate outcomes)
  - Prescription of an antipsychotic within the recommended dosage range[30,43,48] or justification for antipsychotic prescribing outside recommended practices[49] (e.g., two or more antipsychotics,[38,45,46,49] doses outside of recommended range,[49] medication change to address severe symptoms or side effects[49])
  - Conformance of care with evidence-based treatment recommendations[56]
  - Adherence to medications as reflected by Medication Possession Ratio[57,58]
  - Duration of untreated psychosis before treatment (which measures the appropriate initiation of antipsychotic treatment),[45] creation of a relapse prevention plan,[40] examination by psychologist for cognitive functioning,[45] referral for cognitive behavioral therapy for psychosis[45]

For patients with *bipolar disorder*, studies suggested the following additional outcomes:

- Specific Outcomes
  - Monitored for change in symptom complex (assess psychotic, hallucinatory, and delusional symptoms)[42,49]
- Specific Proxy Measures (Intermediate outcomes)
  - Prescription of a mood stabilizer with monitoring of therapeutic blood levels (e.g., lithium)[45]
  - Receipt of a recommended adjunctive psychosocial intervention[49]
  - Receipt of guideline concordant medication and psychotherapy treatment[59]

Medical Outcomes

Measures related to cardiovascular disease, metabolic syndrome, general medical screening/preventive care, and smoking status are critically important to measure in an SMI population because these diseases affect the SMI population at a greater rate than the general population.[8] These outcomes are not disease specific, so they are listed in the "Global" category.

Global Outcomes

Studies report the following as important global medical outcomes to consider for patients with SMI:

- Global Outcomes
  - For those with diabetes,[60] HgA1c and low-density lipoprotein-cholesterol (LDL-C)[60]
  - Monitoring of cardiovascular disease (CVD) with LDL-C[20,45]
  - Serum creatinine and thyroid stimulating hormone (TSH)[30,45] for patients treated with lithium
- Global Proxy Measures (Intermediate outcomes)
  - For those with diabetes, annual foot and eye exams,[30,61]
  - Screening for hyperglycemia (blood glucose)[30,37,38,45,52,62] or diabetes (HgA1c)[20,21,45,49,52,53]
  - Screening for cardiovascular disease risk (total cholesterol, high-density lipoprotein [HDL])[30,37,38,45,52,53,62]
  - Receiving a general medical exam (referred to general medical care[30,35,37-40,53] coordination with general medical care providers)
  - Blood pressure measurement[38,42,45,49,52]
  - Screening for weight gain:[38,42,45,53] body mass index (BMI),[45,49,52,53] abdominal waistline measure[52,63]
  - Cancer screening[37,45]
  - Smoking status[30,35,38]
  - Receipt of general health care advice (exercise, diet, sexual health, etc.)[35]

Patient-Centered Outcomes

Global Outcomes

From the literature, we identified the following important global outcomes to consider for patients with SMI:

- Patient involvement in their inpatient treatment (e.g., patient identification of their problems, goals, and agreement with treatment plan, among others)[34]
- Receipt of psychoeducation about their illness[40,45,49]
- Self-management of community functioning (recovery)[41]
- Community inclusion (recovery)[64]
- Receipt of assistance for finding employment[37,38,49]

Specific Outcomes

For patients with schizophrenia, several additional patient-centered outcomes must be considered:

- Family involvement in care plans,[34,35,45,49] psychotherapy,[37,38,65] and psychoeducation[35,40]
- Receipt of psychotherapy[37,65]

- Amount of patient autonomy[35]
- Quality of life assessment[39,40]
- Independent Living Skills assessment[53]
- Housing status[39]

For patients with bipolar disorder, the literature described the following additional patient-centered outcomes:

- Patient report of side effects of medications[42]
- Reasons for patient voluntary discontinuance of medications[42]

Most measures of level of functioning, treatment tolerability, and quality of life are primarily considered patient centered, but can also be considered psychiatric. Of note, many KIs suggested that patient-centered outcomes are likely the most relevant and important outcomes to measure for the SMI population.

Should QMs Be More Strongly Linked With Fidelity to Best Practices or With Outcomes?

We did not identify any published studies that directly answered this question. However, KIs helped frame this issue. They suggested that linking QMs to best practices or outcomes depends on context. In general, measuring change in outcomes is of primary importance. However, focusing on outcomes and overly incentivizing providers may result in unintended consequences such as penalizing providers for working with more challenging cases and making it harder for those with more serious illness to obtain the care they need. KI input suggested that in such cases, process measures may be preferred where fidelity to best practices or treatment guidelines is well established (for example, the schizophrenia treatment guidelines).[54]

GQ 1c: Different Types of QMs Currently Used To Assess Quality of Care and Outcomes in Patients With SMI

Both the literature and the KIs identified QMs currently used, consisting mainly of process-oriented measures addressing psychiatric, medical, and patient-centered outcomes. A review of the primary QM databases (NQMC,[45] Center for Quality Assessment and Improvement in Mental Health,[49] NQF,[20] the NCQA Health Care Effectiveness Data and Information Set [HEDIS] and Performance Measurement,[21] and the Joint Commission National Quality Core Measures[46]) for measures *currently used* for SMI reveals that many of the important psychiatric and medical outcomes identified by KIs as important to measure (listed above in GQ 1b) are available. We found 16 measures that were endorsed by NQF. Among these 16 measures, 6 are core measures used by the Joint Commission as Hospital-based Inpatient Psychiatric Services measures, and 4 HEDIS measures used by CMS. Appendix D provides a compiled list of the QMs relevant to SMI care from both gray and published literature sources.

Potential Advantages of Currently Used QMs in Assessing Quality of Care and Outcomes in Patients With SMI

The literature detailed many potential advantages of QMs in assessing the quality of care and outcomes in patients with SMI. QMs may lead to improved patient autonomy and experience of

care and are tied to better clinical outcomes.[35] Composite QMs are useful to identify the point in the treatment process at which it is best to intervene.[42]

Potential Disadvantages of Currently Used QMs in Assessing Quality of Care and Outcomes in Patients With SMI

In general, the literature said little about potential disadvantages. One important potential disadvantage of QMs noted by the literature is that some QMs may not be flexible enough to address multiple goals such as adherence to guidelines and the influence of patient preferences (e.g., a patient's refusing a medication change). Therefore, a QM may indicate that a provider is not providing quality of care by one standard (e.g., consistency with evidence-based guidelines), while at the same time indicating the provision of quality care by a different standard (e.g., shared decisionmaking). Thus, the QM may place providers in the position of choosing between adhering to the guideline or adapting to the needs of their patients or circumstances.[44] Also, QM data collection can also place an increased burden on health plans and pose challenges in the implementation of performance measures.[44] Finally, as mentioned earlier in the GQ 1a section, KIs noted a potential disadvantage in that incentivizing providers to focus on outcomes might result in unintended consequences, such as penalizing providers for working with more challenging cases and making it harder for those with more serious illness to obtain the care they need. We did not find any literature directly addressing this concern for the seriously mentally ill. There was, however, literature that identified potential disadvantages in non-SMI populations, such as intended consequences including inappropriate clinical care, distracting providers from patient concerns, and negative effects on patient education and autonomy.[66,67]

GQ 1d: Factors Affecting the Implementation of Currently Used QMs

Barriers to the Use of QMs

The literature identified *time* as a main barrier to the use of QMs. As multiple QMs are accepted and incorporated into practice, the burden on existing systems will increase, as will the burden on providers. Two studies also described the time limitation as a financial and staffing barrier to implementation of measures,[44,68] including lack of training.

The privacy and confidentiality of mental health information, can conflict with the data-sharing process of monitoring QMs. Accordingly, many of the existing QMs are unlikely to be quickly taken up by mental health, posing an additional significant barrier.[44] The literature further detailed the challenge in refining QMs for comorbid conditions in SMI.[30] Additionally, the literature identified variations in organizational and financing structures across systems of care and the lack of clear accountability for which providers need to respond to QM results as important barriers to the implementation of QMs in patients with SMI.[30,44,69]

The literature also provided additional potential barriers of QM use in the SMI population, including (1) the redundancy of performance measurement efforts across several arenas,[44,53] (2) having questionable validity because of the unintended consequences of poor implementation (as noted above),[44] and (3) the limitations in using different types of data to characterize quality. Although commonly used, administrative data can be limiting owing to the challenges of translating this form of data into clinically meaningful actions [44] Further, medical data indicators can be difficult to collect and expensive.[53]

Of note, despite KI concerns about how an emphasis on improved outcomes might lead providers to avoid the sickest SMI patients, the literature did not assess whether case-mix severity is a barrier to care for those with the most severe forms of SMI.

Facilitators to the Use of QMs

The literature found that being an evidence- and/or guideline-based QM that could be applied flexibly across SMI conditions facilitated uptake.[48,65] For example, hospitalization is an effective evidence-based proxy outcome for SMI research.[40,70] Further, being able to effectively integrate clinical process measures with outcome measures is another facilitator to QM use.[34] In other words, the more feasible QMs are to implement, the more likely that they would be used.

The literature highlighted three main areas for facilitating QM use: (1) service improvements with financial incentives, (2) communication enhancement, and (3) patient centeredness. The use of QMs and service improvement are tied to financial incentives.[51,71] Linking the level of consumer need to the level of reimbursement and implementing a documentation system are both facilitators for the use of financial incentives to improve the quality of care.[30,69,72,73] An improved communication-based process plan should span the continuum of care providers. One study found that improved communication across the continuum of providers is a facilitator for QM use and can reduce ER visits. As a result, the pace of activity in ERs is slower, and the quality of care delivered is better.[47] Establishing a framework to improve communication among care providers in how to best delineate their roles and the degrees of accountability in the process of SMI patient care is critical in the success of QM use for SMI.[30] Finally, the literature showed that patient-centeredness in QM development and implementation could be captured in patient outcome data and consumer-based definition or oriented models, which would facilitate the use of the QMs.[41,42,48]

GQ 1e: Usefulness of Currently Available QMs

Although the literature did not directly address how useful various stakeholders found currently available QMs, the evidence base identified the alignment of financial incentives with use of QMs and the development of an evidence base as important parts of increasing the use of QMs. An important caveat is the understanding that evidence-based guidelines or best practices do not generally incorporate patient-centered outcomes, such as personalized needs, patient engagement, or recovery. Hence, QMs aimed at making management more guideline concordant will likely not affect these important outcomes. Of note, one study suggested integrating patient-centered measures with those measures that are based on adherence to guideline-recommended care to be more in line with the shared decisionmaking that takes place between the mental health provider and the SMI patient about clinical care.[42]

Are QMs Currently Being Used for Patient Care and Clinical Decisionmaking?

We found no studies commenting on how QMs are being used currently for SMI patients' care, nor how frequently they are being used, although KIs reported that the Veterans Affairs system routinely uses QMs in clinical decisionmaking for mental health conditions.

Appropriateness of QMs Use

We did not identify any studies that commented on the appropriateness of QM use in SMI.

GQ 1f: How Should QMs Be Used To Measure Outcomes Over Short-Term, Intermediate, and Long-Term Periods?

Investigators have noted the inappropriateness of using only short-term performance measures to demonstrate the quality of contracted services in the UK National Health System for a severely mentally ill population, because this group is made up of long-term users of care,[68] but we did not find studies offering specific direction on how QMs should be used to measure outcomes over varied time periods.

GQ 2: Context in Which QMs for SMI Are Used

We found no articles in the literature that predict the selection of QMs based on organizational components or characteristics of a hospital or other mental health care delivery (2a), clinical characteristics of SMI diagnosis (2b), clinician characteristics (2c), or nonclinical patient characteristics (2d). We identified several articles that mentioned resources needed to implement QMs (2e).

GQ 2e: Resources Needed To Implement Quality Measures

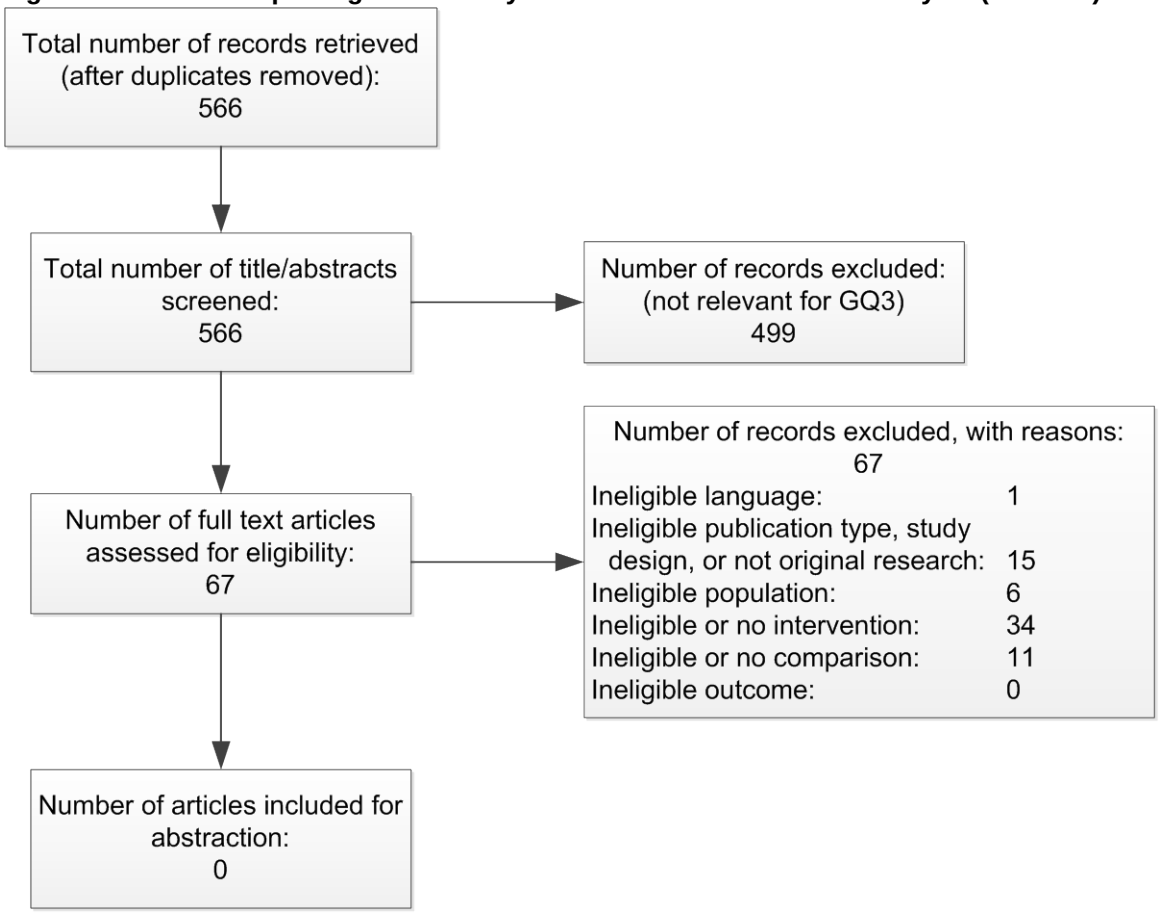
We found consistent support in the literature[29,35,44] and KI responses that infrastructure—personnel, electronic health records, and training—was necessary to implement QMs across a larger system and would then allow for monitoring of QMs across providers.

Studies identified in the literature raised concerns about the potential for significant financial and staffing burdens on health plans as a result of performance measurement efforts.[29,44] One study provided an example of resources needed to develop a Web-based tool for providers to use to collect the data needed for QMs.[35] With the development of new data collection systems comes the need for training of staff to use the electronic systems. Data must be entered correctly to be a reliable source for quality improvement. Resources are needed to train the staff inputting the data, those conducting the assessments and those generating the reports.[35] Even when infrastructure is already in place, QM implementation may require extensive training and ongoing technical support.[29]

GQ 3: Current Evidence About the Effectiveness of QMs for SMI

We searched systematically for evidence linking the use of QMs with improvement in SMI outcomes. We identified 566 citations from database searches, gray literature searches, KI recommendations, and reviews of reference lists (Figure 1). Based on the inclusion criteria described above in Methods, we did not identify any studies that met the inclusion criteria for the effectiveness of QMs for SMI. Although some studies described the need for QMs, none actually addressed implementing a QM and evaluating any subsequent change in outcomes. In the end, the possible studies for inclusion did not address how a QM leads to better quality of care for those with SMI. Although we found studies that map to issues brought up by the KIs, they were more descriptive of the lack of proper care (e.g., SMI patients on antipsychotics not being screened for diabetes,[72,74] dyslipidemia,[72,74] or hypertension[72]). Our review of NIH Reporter and Clinicaltrials.gov did not indicate any ongoing studies that are addressing the link between QMs and improved outcomes in SMI.

Figure 1. Preferred reporting items for systematic reviews and meta-analysis (PRISMA) tree



GQ 4: Current Key Issues in Future Uptake, Use, Evidence Gaps, and Research Priorities for Quality Measures

Our review of the literature did not identify any articles addressing trends in uptake of QMs for SMI or expected short-term or long-term developments in this field. The literature and the KIs were generally in agreement on the gaps in the evidence base for the use of QMs in SMI. Although the literature did not address the issue, the KI interview responses showed mixed opinions on whether QMs can alter decisionmaking; many of the KIs saw potential, but others questioned whether such a link was possible given the potential for unreliability in SMI diagnoses (which QMs cannot change). A key issue is that the evidence base linking use of QMs to improved outcomes is severely limited. High-quality prospective studies are lacking, and the outcomes of most interest to many stakeholders—patient-centered outcomes such as recovery and engagement—can be challenging to measure. Although we identified articles in the literature that addressed research needs in discussions about research gaps, we did not find any articles describing how best to prioritize key areas for future research.

GQ 4a: Trends in the Uptake of QMs for SMI

KI interviews identified three key trends in the uptake of QMs: (1) use of technology in a routine manner in SMI, (2) focus on patient-centered and recovery-based outcomes, and (3) movement toward integrating physical and mental health care.

Technology-related trends include using technological platforms to capture and record relevant outcome data, and aggregate information at individual, group, or population level; enabling health care providers to use electronic health records on a routine basis; and allowing patients to provide data electronically on changes in outcomes. The patient-centered trends noted by more than half of the KIs included efforts made by measure developers to ensure that patients were included in the development and refinement of QMs. Regarding trends related to integrating mental and physical health care, a couple of KIs specifically mentioned evaluating cardio-metabolic outcomes for SMI patients for a better assessment of the physical status of SMI patients. Additionally, they described QMs as enabling better coordination of primary care and behavioral health. This would include standardization of measures across settings (e.g., ensuring that behavioral health-oriented measures do not focus on specialty providers or settings but are also applicable in other settings like primary care and nursing homes).

Other trends suggested by the KIs included the following:

- increased number of initiatives that focus on linking payment to value instead of volume (e.g., pay for performance initiatives that reward good performance on QMs and penalize poor performance);
- increased use of QMs as more providers are required to use them for various system- or payment-based purposes (e.g., because of meaningful use);
- improvement of QM fidelity and concordance of QMs with guidelines;
- increased use of measures in health plans that service Medicare and dually eligible (Medicare/Medicaid) individuals with SMI. Medicaid paid claims data are typically available to State agencies and are therefore available for States to implement QMs (e.g., pharmacy-based QMs).

GQ 4b: Gaps in the Evidence Base for Best Practices or Interventions for Quality Measures for SMI

Articles identified in the literature and KI interviews reported several evidence gaps for SMI QMs.

Several KIs emphasized that the quality measurement field has a limited evidence base to date for many QMs, which could undermine the likelihood of their use. Specific areas KIs mentioned for which there was no evidence tying QMs to improved outcomes involved the following QMs (all of which measured proxy outcomes): posthospitalization followup, measures that assess transitions of care for the SMI population, and receipt of a discharge plan.

This lack of evidence tying the use of QMs to improved outcomes echoed in a number of other related research gaps. KIs suggested that more research is needed to tie proxy measures with clinical and social outcomes. Specifically, gaps exist in the measurement of outcomes in a clinically user-friendly fashion for some of the psychosocial outcomes (e.g., independent living and social relationships).

Another theme focuses on the unclear quality of data used to develop or test QMs. Research has noted that it is difficult to isolate the effects of a particular QM from other influences such as ongoing quality improvement initiatives.[51] Other data quality issues focus on the quality or validity of the dataset itself. The literature has described problems with the data sources (health plan administrative data and Medicare and Medicaid claims data) frequently used to test and assess conformance with quality indicators: they often contain data of questionable validity

because of coding errors and biases in documentation.[44] Others raise similar concerns about relying solely on administrative data to make broad inferences about quality.[53]

Another gap arises from the study designs used in the current evidence base for QMs.[44] The evidence base for QMs often comes from randomized controlled trials (RCTs) testing the efficacy of interventions. However, the eligibility criteria for RCTs can be extremely stringent, yielding results of limited generalizability to typical patients. Longitudinal observational research is needed to evaluate the effectiveness of recommended care in real-world settings. Such studies would also allow researchers to examine clinical rationales for deviations from recommended care.[44]

More direct objections come from critics who claim that quality indicators are weak measures of health care quality because they do not address patient satisfaction.[71] Several KIs observed the general absence of well-validated, easy-to-use patient-centered QMs, including patient engagement.

Some researchers have pointed out that many indicators have strong face validity but will never garner the evidence base linking them to improved outcomes, particularly indicators related to patient centeredness and recovery. To address this problem, future research should consider new ways of assessing whether QMs can successfully predict improved outcomes involving patient satisfaction and emotional well-being.[53] Future research should also assess translational validity (i.e., "the certainty that the operationalization accurately reflects the process of care it is trying to capture") and explore ways to reduce gaps between actual practice and its documentation in the medical record.[53]

One knowledge gap emphasized by a few KIs and echoed in the literature focused on the lack of evidence or knowledge for the efficacy of interventions to address known coexisting medical health problems in the SMI population. For example, a recent systematic review evaluated interventions to improve cardiovascular disease (CVD) risk in adults with SMI.[75] Despite adults with SMI having higher rates of CVD risk factors and higher CVD mortality rates, this review found that very few studies have evaluated the effectiveness of interventions to improve CVD risk factors in the SMI population. Another recent systematic review investigated the effectiveness of interventions targeting SMI patients and focused on increasing the uptake in appropriate cancer screening tests.[76] The authors found no trials meeting their inclusion criteria and concluded that large, quality RCTs "are needed urgently to help address the disparity between people with SMI and others in cancer screening uptake."[76] However, even if a QM were to identify a cardiovascular health problem, the available evidence base does not indicate what the most effective intervention is. A related area with no evidence was the lack of QM measures related to preventive care.

Researchers have proposed a framework for developing future QMs specifically for those with serious mental health disorders and co-occurring conditions (e.g., CVD) that is based on definitions of accountability,[30] (i.e., who is responsible for ensuring that QMs have an impact on improving care for those with comorbid medical problems). The framework is intended to inform an agenda for future research in areas such as QM refinement for co-occurring conditions, validation of measures for integrated services, and defining accountability.

Finally, some KIs noted that research assessing the evidence base for QMs often has a low likelihood of being funded; therefore, the absence of a solid evidence base should not preclude use of QMs that have strong face validity.

GQ 4c: Prioritization of the Key Areas for Future Research

KIs identified various areas for future research, specifically developing and testing evidence-based QMs on care coordination, care planning, drug treatment, patient engagement, functioning (e.g., employment), and recovery. Several KIs also suggested specific focus areas for future research such as outcomes of drug treatment and psychotherapy quality management.

KIs also highlighted the need for future research focusing on how QMs can improve provider performance and patient decisionmaking through emerging technologies. Many KIs noted several systems-level focused areas for future research, such as (1) assessing the impact of QMs on the process of care and whether the benefits outweigh the costs (including opportunity costs), (2) combining QMs with payment mechanisms for mental health care (i.e., understanding how QMs tie into greater cost efficiency), and (3) determining the optimal ways to use data captured in electronic medical records to gauge the quality of a system.

GQs 4d and e: Expected Developments in the Field

We were not able to identify any ongoing studies assessing the link between QMs and outcomes in the SMI population. However, a number of ongoing studies of quality improvement aim to improve care and reduce excess mortality for adults with SMI that potentially could shed light on this link. Researchers are evaluating the efficacy of innovative strategies for care. Current studies assess the effectiveness of the following care strategies and interventions within SMI populations: peer support services,[77] multisession psycho-education classes to reduce internalized stigma,[78] shared decisionmaking medical management programs,[79] Acceptance and Commitment Therapy for inpatients with psychotic disorders,[80] and integrated community care models.[81] An ongoing randomized controlled trial is also evaluating the effectiveness of care models and self-management strategies for individuals with SMI and co-occurring diabetes.[82] Studies are additionally underway to examine the impact of health care system reform and policies on the quality, cost, and accessibility of care for adults with SMI. These include studies on the effects of system-level changes on the care for high-need, high-cost nursing home patients and Medicare and Medicaid recipients,[83] simplified Medicaid enrollment and renewal requirements' effect on insurance coverage of SMI patients,[84] the impact of eliminating annual visit limits for psychotherapy and medical care on service use and cost for publicly insured adults with SMI,[84] whether changes in Medicaid psychiatrist fees are associated with psychiatrist participation in Medicaid and beneficiary access and use,[84] and an examination of organizational- and regulatory-level factors contributing to the disparities in preventive care service use for SMI patients.[85] Results of these studies may inform the development of QMs and future policy and programmatic decisions in the care of individuals with SMI.

Summary and Implications

Monitoring how well quality care is delivered to those with a serious mental illness (SMI), who are some of the most vulnerable Americans served by the Affordable Care Act, is crucial. It is also a great challenge. We have attempted to describe the current state of the art regarding the use of quality measures (QMs) in the seriously mentally ill and to describe the evidence supporting their use. We note that the challenges of QM research are not limited to measurement in the SMI population, but extend to QM measurement in general.[86] For example, in cardiovascular disease, the utility of QMs for improving patient outcomes remains unclear.[87] While measuring quality may improve quality for processes of care, their use has not been shown to improve outcomes; unless these process measures are closely tied to outcomes that individuals directly face as a patient, such as mortality, hospital readmission, or the patient experience, their impact remains quite uncertain.[87] Further, the use of QMs in non-SMI medical populations may have unintended consequences, including inappropriate clinical care, distracting providers from patient concerns, and negative effects on patient education and autonomy.[66,67]

With these caveats, we identify a number of key issues below that we believe affect QM measurement in SMI populations.

A key issue is to determine what strength of evidence base is necessary to support implementation of QMs. Key Informants (KIs) and the literature were in agreement that an evidence base was an important piece of successful implementation, but KIs and the literature both reflected the great challenges inherent in conducting this line of research. KIs emphasized concern for whether such difficult and time-consuming research would get funded, which raises an important question: what strength or degree of evidence base is necessary to proceed with implementation of QMs that may have strong face validity, but limited evidence that using such QMs ultimately improves outcomes? Such a practical discussion is critical in an era of funding constraints.

A second key issue, and our most striking finding, is that no research has studied the association between QM use and improved processes of care or improved outcomes of care for the SMI population. The importance of this absence of evidence cannot be overstated. Evidence does not exist that indicates that certain processes or measures often used as proxies for quality of care actually measure quality of care or improve outcomes. Such evidence is necessary before poorly constructed QMs are put into place and physician care/performance is linked to them. This is a key issue for an initiative that intends to be evidence based, and the absence of such a base creates substantial barriers to implementation. Specifically, without such an evidence base, it is challenging to identify the most effective QMs to implement in specific situations.

An evidence base is absent for outcomes (the standards against which QMs are measured) as well as for the QMs themselves. For the former, the most meaningful psychiatric and patient-centered outcomes (those that reflect patients' ability to function and participate in their community) are very difficult to measure accurately; most outcomes measures instead reflect proxies (processes of care or fidelity to evidence-based guidelines), which themselves have an unclear relation to improved outcomes and do not generally incorporate patient-centered outcomes. Having these outcomes is necessary to assess the effectiveness of a QM. Without such clear and meaningful outcome standards, the effectiveness of QMs cannot be assessed. For the latter, the diversity of opinions on how to define and identify QMs and which ones are preferable to use complicates the decision about which QMs to test. As noted above, it is not clear that the QMs used in other medical conditions fare better than those used in SMI; indeed, links between QMs and outcomes in non-SMI conditions can be similarly thin.[88,89]

A third issue is considering when to invest the time and resources on measuring outcomes of care to evaluate the impact of QMs and when process measures (proxies of the outcomes) are a reasonable and more feasible alternative. Although KIs ultimately noted that outcomes are the most important measures, many KIs supported measuring processes rather than outcomes to prevent incentivizing providers to take on the easier cases. The literature was beginning to address how to adjust for case mix, but this remained a very strong concern. This tension over what QMs should measure hinders QM implementation and decisions about how to select the best QMs to use.

A fourth issue emphasizes that barriers to QM implementation were not limited to the absence of an evidence base, but also involve the need for resources to support such a substantial change in practice. Key resource barriers include limited time (e.g., any time to assess QMs took away from patient care) and the need for personnel, electronic health records, and training to implement and follow up on QMs (e.g., if a patient missed followup after psychiatric hospitalization, was the hospital or the outpatient provider responsible for making sure that the patient was seen in followup?). A practical consideration here is making sure that outcomes measured are comprehensive (i.e., they include service use that is provided across the different health care systems that a patient may access). KIs suggested that collaboration might lead to more cost-effective approaches to QM data collection monitoring and prevent scarce health care resources from being diverted from direct patient care. The literature and the KIs agree that better aligning payment with quality of care measures, rather than volume of services, is necessary to increase the likelihood of QM use. Such a shift would be a dramatic change and would likely require a substantial effort.

A fifth issue is for a QM to address the practical needs of the health care providers. For QMs to affect patient care, at least some had to show real-time use, be feasible, and provide actionable information. Clinicians need to see outcomes in real time so that they can immediately modify their interventions to address poor outcomes, consistent with a quality improvement cycle.

Next Steps

Based on the literature review and interviews with Key Informants (KIs), we identified certain questions that need to be explored to improve the selection, implementation, and evidence base for the use of quality measures (QMs) in the seriously mentally ill.

1. What Strength of Evidence Base Linking QMs to Improved Outcomes Is Necessary To Support Implementation of QMs?

Currently no evidence base links QMs directly with improved outcomes, although stakeholders note the importance of having one. Practical considerations may play a key role here. Stakeholders believe that research assessing the evidence base for QMs often has a low likelihood of being funded, and they identified an important consideration to be whether the absence of a solid evidence base should preclude use of QMs that have strong face validity. Given the challenges of developing such an evidence base (both financial and temporal), stakeholders need a plan to test meaningful and measurable QMs as well as an understanding of whether/how to select and implement QMs in the absence of a clear evidence base.

Suggestions for Addressing This Question

A meeting with stakeholders can be used to design an action plan for obtaining the relevant evidence necessary to develop a useful evidence base. Discussions would include the need for randomized controlled trials versus other study designs (e.g., observational cohorts, use of secondary data analyses of large databases), how best to target the use of likely limited research funding, and evidence thresholds that need to be met before supporting the use of a QM. Essential areas to research include (1) assessing the impact of QMs on the process of care and whether the benefits outweigh the costs, (2) combining QMs with payment mechanisms for mental health care (i.e., understanding how QMs tie into greater cost efficiency), and (3) understanding how electronic medical records can be used to gauge the quality of a system. The design and implementation of a randomized controlled trial or a quasi-experimental study to test the effectiveness of a QM or set of QMs relative to a meaningful and feasible outcome would be an especially important step.

2. What Are the Most Important Outcomes With Which To Compare QMs?

This step is key to developing effective QMs. Stakeholders need to agree on meaningful, measurable, and actionable outcomes to set as standards. These outcomes will likely involve both outcomes and proxy outcomes, with stakeholders noting what constitutes a reasonable balance.

Suggestions for Addressing This Question

As with question #1, a meeting with broad participation from key stakeholder groups may be useful for reaching a general consensus on this issue. Ideally, these groups would include representatives from the National Committee for Quality Assurance, the National Quality Forum, and the Joint Commission. Input from both providers and patients is especially important.

3. How To Address Resource Barriers for QM Implementation?

Although the above questions emphasize the limited knowledge base as a barrier to implementation, the limited resource base to support implementation in real world clinic settings is a similarly important barrier. Indeed, the challenges of collecting QM data in ways that providers and organizations can use them; of analyzing the data; and of providing data-driven feedback to providers that allow a clinical response in real time may be as difficult as developing the evidence base. Key variables include personnel, electronic health records, and training on implementing and monitoring QMs.

Suggestions for Addressing This Question

Models that consider how to balance personnel needs, patient care needs, and financial demands need to be tested. The Department of Veteran Affairs system, which has addressed some of these barriers, might be able to provide useful guidance. The State of Maryland, in collaboration with the University of Maryland, has also been successful implementing the use of quality of care measures in real-world practice. Also, conducting research projects collaboratively designed by various stakeholders to help sort out these critical areas would help inform this issue.

4. What Is a Reasonable and Feasible Collection of QMs To Be Implemented, and How Might These Collections Be Tailored to Specific Settings and Purposes?

Much of this information would likely be guided by research findings referred to in question #2 above. Input from providers and patients, especially regarding feasibility and applicability to particular settings, would be especially useful here. Currently, providers have a large collection of potentially relevant QMs with little guidance to select which measures to use (beyond those requiring measures to obtain reimbursement).

Suggestions for Addressing This Question

As noted above, the developing evidence base plus input from those involved in implementation (patients, providers) would guide the development of this collection. Identification of a feasible and clinically useful inventory of QMs for a particular setting is critical.

5. How Best To Address the Conceptual Issues That Underlie the Role of QMs in the Care of the SMI Population?

Consideration of how QMs might be able to effectively improve clinical practices requires understanding the links between three areas—routine clinical practice; the identification, selection, and implementation of QMs (which is informed by routine clinical practice); and what change can be expected from implementing QMs (which is informed by both routine clinical practice and what QMs are implemented). Our review did not address the first area, which provides the layer of evidence to generate QMs. We found only qualitative information for the second area (Guiding Questions [GQs] 1 and 2). And we found no evidence addressing the third area (GQ 3).

Suggestions for Addressing This Question

The links between these three areas are unknown, and the evidence addressing these areas is missing. We recommend considering an expert panel that can think through a number of key conceptual issues to guide work in this area, to include addressing the following question: What are the conceptual relationships between routine clinical practice; identification, selection, and implementation of QMs; and expected change from implementation of QMs?

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85. Green CA. Understanding Disparities in Preventive Services for Patients with Mental Illness. Kaiser Foundation Research Institute Report No: 5R01MH096795-02. Oakland, CA: 2013.

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87. Chatterjee P, Joynt KE. Do cardiology quality measures actually improve patient outcomes? J Am Heart Assoc. 2014;3(1):e000404. PMID: 24510114.

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Appendix A. Key Informant Interview and Literature Search Methodology

Key Informant Interview Methodology

We adhered to the Office of Management and Budget (OMB) requirements and limited standardized questions (the list of Guiding Questions [GQs]) to no more than 9 nongovernment-associated individuals. As a result, we did not need to obtain OMB clearance for the interviews.

After review and approval of the completed Disclosure of Interest forms for the proposed Key Informants (KIs) by the Agency for Healthcare and Quality (AHRQ), over a 6-week period, we conducted interviews with 11 selected KIs, 2 of whom were government-associated individuals and did not count toward the OMB limit of 9 individuals who could be interviewed without clearance. The interviews were a combination of individual KIs and groups of KIs based on availability and concordance of perspectives. A co-investigator from the Evidence-based Practice Center (EPC) team led each of the KI interviews, and the Task Order Officer (TOO) was in attendance for all of the interviews along with other EPC team members. The recorded KI interviews ranged in duration from 1.0 hours to 1.5 hours. Following each interview, we summarized the interviews in writing by incorporating summary notes prepared by team members; interview recordings; and, for some, a professional transcription of the interview. We then submitted notes to the TOO for documentation. Using NVivo® qualitative software (v9.0), we auto-coded the KIs' responses by relevant GQs and subquestions and generated summary reports by subquestion for analysis by the authors. Authors evaluated summary reports, corrected or added codes by referring to the original summary notes, and identified key themes from multiple perspectives. In addition, authors also identified unique perspectives from KIs.

Literature Search Methodology

Sources for the gray literature include the following:

- HAPI: Health and Psychosocial Instruments provide bibliographic access and descriptions of tests, manuals, rating scales, and other instruments used to assess health and behavior. Assists researchers and others in locating instruments used in the health fields, psychosocial sciences, occupational sciences, library and information science, and education.
- OpenSIGLE: Operated by GreyNet, the OpenSIGLE Repository preserves and makes openly accessible research results originating in the International Conference Series on Grey Literature. GreyNet together with the Institute for Scientific and Technical Information-National Center for Scientific Research designed the format for a metadata record, which encompasses standardized PDF attachments for full-text conference preprints, PowerPoint presentations, abstracts and biographical notes. All 11 volumes (1993–2009) of the GL Conference Proceedings are available in the OpenSIGLE Repository.
- ClinicalTrials.gov: ClinicalTrials.gov offers up-to-date information for locating federally and privately supported clinical trials for a wide range of diseases and conditions. The site currently contains approximately 12,400 clinical studies sponsored by the National Institutes of Health, other Federal agencies, and private industry. Studies listed in the database are conducted in all 50 States and in more than 100 countries.

- Academic Search Complete: This source provides information from a wide range of academic areas, including business, social sciences, humanities, general academic, general science, education and multicultural topics. This multidisciplinary database features full-text for more than 4,000 journals with many dating back to 1975, abstracts and indexing for more than 8,200 scholarly journals, and coverage of selected newspapers and other news sources.
- NIH RePORTER: The information found in RePORTER is drawn from several extant databases (eRA databases, Medline®, PubMed Central, the NIH Intramural Database, and iEdison), using newly formed linkages among these disparate data sources.
- ERIC: Produced by the Educational Resource Information Center, this source provides indexing and abstracting for journal and report literature (1966 to the present) in education and related disciplines. Also includes curricular materials such as courses of study, books, conferences papers and theses.

Appendix B. Search Strategy and Yields

Pub Med Search Terms (November 2013)

Search #	Query	Items Found
#1	Search "Quality Indicators, Health Care"[Mesh]	12097
#2	Search "Mood Disorders"[Mesh] OR "Schizophrenia and Disorders with Psychotic Features"[Mesh] OR ((severe OR serious OR persistent) mental illness[Text Word])	213560
#4	Search (#1 AND #2) Filters: Humans	99
#5	Search (#1 AND #2) Filters: Humans; Adult: 19+ years	61
#6	Search (#1 AND #2) Filters: Humans; English; Adult: 19+ years	56
#7	Search (("Mental Health Services"[Mesh] OR "Community Mental Health Services"[Mesh])) Filters: Humans; English; Adult: 19+ years	23249
#9	Search (#1 AND #7) Filters: Humans; English; Adult: 19+ years	89
#11	Search (#6 OR #9) Filters: Humans; English; Adult: 19+ years	127
#13	Search "Mental Health Services/standards"[MAJR] Filters: Humans; English; Adult: 19+ years	932
#15	Search (#1 AND #13) Filters: Humans; English; Adult: 19+ years	41
#17	Search (#11 OR #15) Filters: Humans; English; Adult: 19+ years	127

Additional Pub Med Searches (December 2013)

Search #	Query	Items Found
#1	Search medicaid reform	2375
#2	Search medicaid reform mental health measures	7
#7	Search "Quality Indicators, Health Care"[Mesh]	11876
#10	Search "Health Care Reform"[Mesh]	27355
#11	Search (#7 AND #10)	213
#13	Search "Mental Health"[Mesh] OR "Mental Health Services"[Mesh]	90197
#14	Search (#11 AND #13)	7
#15	Search pay for (performance OR reporting)	4860
#16	Search (#13 AND #15)	74
#17	Search (#13 AND #15) Filters: Humans	67
#18	Search (#13 AND #15) Filters: Humans; English	66
#19	Search (#18 AND #17) Filters: Humans; English	66

Search #	Query	Items Found
#3	Search "Reimbursement, Incentive"[MAJR]	1795
#4	Search "Mental Disorders/therapy"[MeSH Terms]	327010
#5	Search (#3 AND #4)	30
#6	Search (#3 AND #4) Filters: Humans	30
#7	Search (#3 AND #4) Filters: Humans; English	30

Medicaid Reform New = 0
Pay for Performance/Reporting New = 74

Search #	Query	Items Found
#5	Search ("Quality Assurance, Health Care"[Majr]) AND "Quality Indicators, Health Care"[Majr]	1451
#6	Search ("Quality Assurance, Health Care"[Majr]) AND "Quality Indicators, Health Care"[Majr] Filters: Humans	1265
#7	Search ("Quality Assurance, Health Care"[Majr]) AND "Quality Indicators, Health Care"[Majr] Filters: Humans; English	1132
#8	Search ("Quality Assurance, Health Care"[Majr]) AND "Quality Indicators, Health Care"[Majr] Filters: Humans; English; Adult: 19+ years	242
#12	Search "Mental Disorders"[Mesh] Filters: Humans; English	707192
#14	Search "Mental Health Services"[Mesh] Filters: Humans; English	58800
#15	Search (#12 OR #14) Filters: Humans; English	739957
#16	Search (#7 AND #15) Filters: Humans; English	47

Additions based on suggestions = 47 = 25 new
Cochrane = 8 = new
PsycInfo = 11 = new
OpenGrey = 23
ClinicalTrials.gov = 4
Academic Search Complete = 5 = new
HAPI = 0
ERIC = 4
NIH RePORTer = 14
National Guidelines Clearinghouse (NGC) = 0 new
National Quality Measures Clearinghouse (NQMC) = 0 new
The Joint Commission) = 0 new
Hand entered = 9
Total Unduplicated Database = 195

Search #	Query	Items Found
#2	Search puschner b	131
#3	Search puschner b AND CEDAR	2
#6	Search CEDAR study group[Corporate Author]	1
#7	Search ISRCTN75841675	3
#9	Search 23379280[uid]	1

Update Pub Med Search (August 2014)

Search #	Query	Items Found
#1	Search "Quality Indicators, Health Care"[Mesh]	12882
#2	Search ((severe OR serious OR persistent) mental illness[Text Word])	5356
#3	Search (#1 AND #2)	16
#4	Search (#1 AND #2) Filters: Publication date from 2013/06/01; Humans; English; Adult: 19+ years	0
#7	Search "Mood Disorders"[Mesh] OR "Schizophrenia and Disorders with Psychotic Features"[Mesh]OR Depression[Mesh] OR (("Depressive Disorder, Major"[Mesh]) OR "Anxiety Disorders"[Mesh]) OR "Eating Disorders"[Mesh] OR "Personality Disorders"[Mesh] OR ((severe OR serious OR persistent) mental illness[Text Word])	370754
#8	Search (#1 AND #7) Filters: Publication date from 2013/06/01	8
#9	Search (#1 AND #7)	161
#11	Search ("Mental Health Services"[Mesh] OR "Community Mental Health Services"[Mesh])	73810
#12	Search (#1 AND #11) Filters: Publication date from 2013/06/01	5
#13	Search (#1 AND #11)	270
#15	Search ("Mental Health Services/standards"[MAJR])	3690
#16	Search (#1 AND #15) Filters: Publication date from 2013/06/01	1
#17	Search (#1 AND #15)	139
#22	Search (#16 OR #12 OR #8) Filters: Publication date from 2013/06/01; Humans; English; Adult: 19+ years	11

Search #	Query	Items Found
#2	Search medicaid reform	2537
#3	Search medicaid reform mental health measures	7
#4	Search "Quality Indicators, Health Care"[Mesh]	12882
#5	Search "Health Care Reform"[Mesh]	28374
#6	Search (#4 AND #5)	226
#7	Search "Mental Health"[Mesh] OR "Mental Health Services"[Mesh]	93486
#8	Search (#6 AND #7)	5
#9	Search pay for (performance OR reporting)	2751
#10	Search (#7 AND #9)	61
#11	Search (#3 OR #8 OR #10)	44
#12	Search (#3 OR #8 OR #10) Filters: English	43
#13	Search (#3 OR #8 OR #10) Filters: Humans; English	42
#14	Search (#3 OR #8 OR #10) Filters: Publication date from 2013/06/01; Humans; English	5

Search #	Query	Items Found
#1	Search "Reimbursement, Incentive"[MAJR] Filters: Publication date from 2013/06/01; Humans; English	36
#2	Search "Reimbursement, Incentive"[MAJR]	1916
#3	Search "Mental Disorders/therapy"[MeSH Terms] Filters: Publication date from 2013/06/01; Humans; English	1579
#4	Search "Mental Disorders/therapy"[MeSH Terms]	338119
#5	Search (#1 AND #3) Filters: Publication date from 2013/06/01; Humans; English	0

Search #	Query	Items Found
#1	Search (("Quality Assurance, Health Care"[Majr]) AND "Quality Indicators, Health Care"[Majr]) Filters: Publication date from 2013/06/01; Humans; English	27
#2	Search (("Quality Assurance, Health Care"[Majr]) AND "Quality Indicators, Health Care"[Majr])	1541
#3	Search (("Quality Assurance, Health Care"[Majr]) AND "Quality Indicators, Health Care"[Majr]) Filters: Publication date from 2013/06/01; Humans; English; Adult: 19+ years	5
#4	Search "Mental Disorders"[Mesh] Filters: Publication date from 2013/06/01; Humans; English	4589
#6	Search "Mental Health Services"[Mesh] Filters: Publication date from 2013/06/01; Humans; English	343
#9	Search (#4 OR #6)	4810
#10	Search (#2 AND #9) Filters: Publication date from 2013/06/01; Humans; English	0

Search #	Query	Items Found
#1	Search "Psychometrics"[Mesh] Filters: Publication date from 2013/06/01; Humans; English	332
#3	Search ((severe OR serious OR persistent) mental illness[Text Word])Filters: Publication date from 2013/06/01; Humans; English	1619
#4	Search (#1 AND #3) Filters: Publication date from 2013/06/01; Humans; English	5

Search #	Query	Items Found
#3	Search CEDAR study group[Corporate Author]	2
#4	Search ISRCTN75841675	5
#5	Search (#3 OR #4)	5
#6	Search (#3 OR #4) Filters: Publication date from 2013/06/01	2

PubMed new = 22
Cochrane = 4
PsycInfo = 6 = 5 new
OpenGrey = 0
ClinicalTrials.gov = 1
Academic Search Complete = 3 = 1 new
HAPI = 0
ERIC = 0
NIH RePORTer = 6 = 4 new

Total New Database = 37

Appendix C. Full Text Excludes

Exclusion Code Key:
XL=Ineligible language (not in English)
X1=Ineligible publication type, ineligible study design, or not original research
X2=Ineligible population
X3=Ineligible or no intervention
X4=Ineligible or no comparison group
X5=Ineligible outcome

1. Perlman CM, Hirdes JP, Barbaree H, et al. Development of mental health quality indicators (MHQIs) for inpatient psychiatry based on the interRAI mental health assessment. BMC Health Serv Res. 2013;13:15. PMID: 23305286. Exclusion Code: X3
2. Killaspy H, Marston L, Omar RZ, et al. Service quality and clinical outcomes: an example from mental health rehabilitation services in England. Br J Psychiatry. 2013 Jan;202(1):28-34. PMID: 23060623. Exclusion Code: X3
3. Hunt Glenn E, Siegfried N, Morley K, et al. Psychosocial interventions for people with both severe mental illness and substance misuse. Cochrane Database of Systematic Reviews: John Wiley & Sons, Ltd; 2013. Exclusion Code: X3
4. Barley E, Borschmann R, Walters P, et al. Interventions to encourage uptake of cancer screening for people with severe mental illness. Cochrane Database Syst Rev: John Wiley & Sons, Ltd; 2013. Exclusion Code: X3
5. Reilly S, Planner C, Gask L, et al. Collaborative care approaches for people with severe mental illness. Cochrane Database Syst Rev: John Wiley & Sons, Ltd; 2013. Exclusion Code: X3
6. Gierisch JM, Nieuwsma JA, Bradford DW, et al. Interventions to improve cardiovascular risk factors in people with serious mental illness. Report No.: 13-EHC063-EF. Agency for Healthcare Research and Quality. 2013. http://onlinelibrary.wiley.com/o/cochrane/cldare/articles/DARE-12013022147/frame.html Exclusion Code: X3
7. Chow CM, Wieman D, Cichocki B, et al. Mission impossible: treating serious mental illness and substance use co-occurring disorder with integrated treatment: a meta-analysis. Mental Health and Substance Use; 2013. p. 150-68. Exclusion Code: X3
8. Deuschle M, Paul F, Brosz M, et al. Assessment of cardiovascular disease risk in patients with schizophrenia spectrum disorders in German psychiatric hospitals: results of the pharmacoepidemiologic CATS study. Soc Psychiatry Psychiatr Epidemiol. 2013;48(8):1283-8. PMID: 89077876. Exclusion Code: X3
9. Bella M, Somers SA, Llanos K. Providing Behavioral Health Services to Medicaid Managed Care Enrollees. Options for Improving the Organization and Delivery of Services. New York: Medicaid Institute™ at United Hospital Fund; 2009. Exclusion Code: X1
10. Lind A. Measuring Quality for Complex Medicaid Beneficiaries in New York. New York: Medicaid Institute™ at United Hospital Fund; 2011. Exclusion Code: X1

11. Brown JD, Barrett A, Ireys H, et al. Evidence-Based Practices for Medicaid Beneficiaries with Schizophrenia and Bipolar Disorder. Washington, DC: U.S. Department of Health and Human Services; 2012. http://aspe.hhs.gov/daltcp/reports/2012/ebpsbd.pdf. Exclusion Code: X1

12. Simon S, Croghan T, Saunders RC, et al. Developing Quality Measures for Medicaid Beneficiaries with Schizophrenia: Final Report. Washington, DC: U.S. Department of Health and Human Services; 2012. http://aspe.hhs.gov/daltcp/reports/2012/schqm.shtml. Exclusion Code: X1

13. Alakeson V. The Contribution of Self-Direction to Improving the Quality of Mental Health Services. Washington, DC: U.S. Department of Health and Human Services; 2007. Exclusion Code: X3

14. Schwalbe L. Behavioral Health Providers: Expenditures, Methods and Sources of Payment, Electronic Health Record Incentive Payments for Certain Behavioral Health Providers Policy Descriptions. Washington, DC: U.S. Department of Health and Human Services; 2010. http://aspe.hhs.gov/daltcp/reports/2010/behhp.htm. Exclusion Code: X1

15. Lewin Group. ASPE Technical Expert Panel on Earlier Intervention for Serious Mental Illness: Summary of Major Themes. Washington, DC: U.S. Department of Health and Human Services; 2009. http://aspe.hhs.gov/daltcp/reports/2009/TEPonEI.pdf Exclusion Code: X3

16. Charlwood P. Severe mental illness Report of a working group to the Department of Health. National Centre for Health Outcomes Development (United Kingdom). London: 1999. http://hdl.handle.net/10068/547224 Exclusion Code: X1

17. Plever S, McCarthy I, Emmerson B, et al. Clinical Practice Improvement Payments: incentives for delivery of quality care. Australas Psychiatry. 2012 Oct;20(5):407-12. PMID: 23014128. Exclusion Code: X4

18. Adams P, Nielson H. Evidence based practice: decreasing psychiatric revisits to the emergency department. Issues Ment Health Nurs. 2012 Aug;33(8):536-43. PMID: 22849781. Exclusion Code: X3

19. IT vendor survey. Behav Healthc. 2011 Sep;31(6):12-7. PMID: 22026107. Exclusion Code: X1

20. Grantham D. Maximize your EHR incentives. Everything you wanted to know about HITECH EHR incentives, but were afraid to ask. Behav Healthc. 2010 Jul-Aug;30(7):10-5. PMID: 22195308. Exclusion Code: X1

21. Kilbourne AM, Greenwald DE, Hermann RC, et al. Financial incentives and accountability for integrated medical care in Department of Veterans Affairs mental health programs. Psychiatr Serv. 2010 Jan;61(1):38-44. PMID: 20044416. Exclusion Code: X5

22. Bellows NM, Halpin HA. Impact of Medicaid reimbursement on mental health quality indicators. Health Serv Res. 2008 Apr;43(2):582-97. PMID: 18370968. Exclusion Code: X2

23. Macias C, Rodican CF, Hargreaves WA, et al. Supported employment outcomes of a randomized controlled trial of ACT and clubhouse models. Psychiatr Serv. 2006 Oct;57(10):1406-15. PMID: 17035557. Exclusion Code: X3

24. Hodgkin D, Horgan CM, Garnick DW, et al. Quality standards and incentives in managed care organizations' specialty contracts for behavioral health. J Ment Health Policy Econ. 2002 Jun;5(2):61-9. PMID: 12529562. Exclusion Code: X2

25. Parameswaran S, Spaeth-Rublee B, Huynh PT, et al. Comparison of national mental health quality assessment programs across the globe. Psychiatr Serv. 2012 Oct;63(10):983-8. PMID: 22855298. Exclusion Code: X1

26. Addington DE, McKenzie E, Wang J. Validity of hospital admission as an outcome measure of services for first-episode psychosis. Psychiatr Serv. 2012 Mar;63(3):280-2. PMID: 22267251. Exclusion Code: X3

27. Pfeiffer PN, Ganoczy D, Zivin K, et al. Outpatient follow-up after psychiatric hospitalization for depression and later readmission and treatment adequacy. Psychiatr Serv. 2012 Dec;63(12):1239-42. PMID: 23203359. Exclusion Code: X2

28. Teague GB, Mueser KT, Rapp CA. Advances in fidelity measurement for mental health services research: four measures. Psychiatr Serv. 2012 Aug;63(8):765-71. PMID: 22854723. Exclusion Code: X1

29. Cohen A. The QOF, NICE, and depression. Br J Gen Pract. 2011 Sep;61(590):549. PMID: 22152732. Exclusion Code: X1

30. Kilbourne AM, Fullerton C, Dausey D, et al. A framework for measuring quality and promoting accountability across silos: the case of mental disorders and co-occurring conditions. Qual Saf Health Care. 2010 Apr;19(2):113-6. PMID: 20142404. Exclusion Code: X3

31. Williams TL, Cerese J, Cuny J, et al. Outcomes of an initial set of standardized performance measures for inpatient mental health. Jt Comm J Qual Patient Saf. 2008 Jul;34(7):399-406. PMID: 18677871. Exclusion Code: X1

32. Unutzer J, Chan YF, Hafer E, et al. Quality improvement with pay-for-performance incentives in integrated behavioral health care. Am J Public Health. 2012 Jun;102(6):e41-5. PMID: 22515849. Exclusion Code: X2

33. Kilbourne AM, Rofey DL, McCarthy JF, et al. Nutrition and exercise behavior among patients with bipolar disorder. Bipolar Disord. 2007 Aug;9(5):443-52. PMID: 17680914. Exclusion Code: X3

34. Kilbourne AM, Lai Z, Bowersox N, et al. Does colocated care improve access to cardiometabolic screening for patients with serious mental illness? Gen Hosp Psychiatry. 2011 Nov-Dec;33(6):634-6. PMID: 21872334. Exclusion Code: X3

35. Kilbourne AM, Pirraglia PA, Lai Z, et al. Quality of general medical care among patients with serious mental illness: does colocation of services matter? Psychiatr Serv. 2011 Aug;62(8):922-8. PMID: 21807832. Exclusion Code: X4

36. Pirraglia PA, Kilbourne AM, Lai Z, et al. Colocated general medical care and preventable hospital admissions for veterans with serious mental illness. Psychiatr Serv. 2011 May;62(5):554-7. PMID: 21532086. Exclusion Code: X4

37. Kilbourne AM, Post EP, Bauer MS, et al. Therapeutic drug and cardiovascular disease risk monitoring in patients with bipolar disorder. J Affect Disord. 2007 Sep;102(1-3):145-51. PMID: 17276514. Exclusion Code: X3

38. Kilbourne AM, Welsh D, McCarthy JF, et al. Quality of care for cardiovascular disease-related conditions in patients with and without mental disorders. J Gen Intern Med. 2008 Oct;23(10):1628-33. PMID: 18626722. Exclusion Code: X3

39. Brissos S, Molodynski A, Dias VV, et al. The importance of measuring psychosocial functioning in schizophrenia. Ann Gen Psychiatry. 2011;10:18. PMID: 21702932. Exclusion Code: X3

40. Sherring J, Robson E, Morris A, et al. A working reality: evaluating enhanced intersectoral links in supported employment for people with psychiatric disabilities. Aust Occup Ther J. 2010 Aug;57(4):261-7. PMID: 20854601. Exclusion Code: X3

41. Salyers MP, McGuire AB, Rollins AL, et al. Integrating assertive community treatment and illness management and recovery for consumers with severe mental illness. Community Ment Health J. 2010 Aug;46(4):319-29. PMID: 20077006. Exclusion Code: X3

42. Bassani DG, Dewa CS, Krupa T, et al. Factor structure of the Multnomah Community Ability Scale--longitudinal analysis. Psychiatry Res. 2009 May 15;167(1-2):178-89. PMID: 19361868. Exclusion Code: X3

43. Adair CE, McDougall GM, Mitton CR, et al. Continuity of care and health outcomes among persons with severe mental illness. Psychiatr Serv. 2005 Sep;56(9):1061-9. PMID: 16148318. Exclusion Code: X4

44. Burger GK, Yonker RD, Calsyn RJ, et al. Generalizability of brief psychiatric rating scale prototypical profiles and their use in evaluating treatment outcomes. Int J Methods Psychiatr Res. 2005;14(1):56-64. PMID: 16097400. Exclusion Code: X1

45. Brown C, Moore WP, Hemman D, et al. Influence of instrumental activities of daily living assessment method on judgments of independence. Am J Occup Ther. 1996 Mar;50(3):202-6. PMID: 8822243. Exclusion Code: X4

46. Kilbourne AM, Farmer Teh C, Welsh D, et al. Implementing composite quality metrics for bipolar disorder: towards a more comprehensive approach to quality measurement. Gen Hosp Psychiatry. 2010 Nov-Dec;32(6):636-43. PMID: 21112457. Exclusion Code: X3

47. Barnes TR, Paton C, Hancock E, et al. Screening for the metabolic syndrome in community psychiatric patients prescribed antipsychotics: a quality improvement programme. Acta Psychiatr Scand. 2008 Jul;118(1):26-33. PMID: 18582345. Exclusion Code: X2

48. Whyte S, Penny C, Phelan M, et al. Quality of diabetes care in patients with schizophrenia and bipolar disorder: cross-sectional study. Diabet Med. 2007 Dec;24(12):1442-8. PMID: 18042084. Exclusion Code: X3

49. Busch AB, Huskamp HA, Landrum MB. Quality of care in a Medicaid population with bipolar I disorder. Psychiatr Serv. 2007 Jun;58(6):848-54. PMID: 17535947. Exclusion Code: X4

50. Goldberg RW, Kreyenbuhl JA, Medoff DR, et al. Quality of diabetes care among adults with serious mental illness. Psychiatr Serv. 2007 Apr;58(4):536-43. PMID: 17412857. Exclusion Code: X4

51. Chong SA, Vaingankar JA, Chan YH, et al. Assessing the quality of care for patients with first-episode psychosis. Singapore Med J. 2006 Oct;47(10):882-5. PMID: 16990964. Exclusion Code: X3

52. Gorrell J, Cornish A, Tennant C, et al. Changes in early psychosis service provision: a file audit. Aust N Z J Psychiatry. 2004 Sep;38(9):687-93. PMID: 15324332. Exclusion Code: X2

53. Weinmann S, Roick C, Martin L, et al. Development of a set of schizophrenia quality indicators for integrated care. Epidemiol Psichiatr Soc. 2010 Jan-Mar;19(1):52-62. PMID: 20486424. Exclusion Code: XL

54. Kilbourne AM, Keyser D, Pincus HA. Challenges and opportunities in measuring the quality of mental health care. Can J Psychiatry. 2010 Sep;55(9):549-57. PMID: 20840802. Exclusion Code: X1

55. Tosh G, Clifton Andrew V, Xia J, et al. General physical health advice for people with serious mental illness. Cochrane Database of Systematic Reviews: John Wiley & Sons, Ltd; 2014. Exclusion Code: X4

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Appendix D. Quality Measures for SMI

Contents

Table D-1. Identified quality measures for psychiatric care in key quality measure databases: Antipsychotic prescribed

Quality of Care Concern	Type of SMI	Full Quality Measure	Developer	Evidence for Measure	Use of Measure
Prescribed an antipsychotic	Schizophrenia	Proportion of patients who have a prescription for antipsychotic medication	The Danish National Schizophrenia Registry	A formal consensus procedure, involving experts in relevant clinical, methodological, public health and organizational sciences	Accreditation Collaborative inter-organizational quality improvement Decisionmaking by consumers about health plan/provider choice Decisionmaking by managers about resource allocation External oversight/Regional, county, or city agencies External oversight/State government program Internal quality improvement National reporting Quality of care research
Prescribed an antipsychotic	Schizophrenia	Antipsychotic prescribed	CQAIMH, Developer: American Psychiatric Association	AHRQ Level B: Fair research evidence and supporting clinical consensus/ opinion	NR
Prescribed an antipsychotic	Schizophrenia	Antipsychotic prescribed	CQAIMH, Developer: National Association of State Mental Health Program Directors	AHRQ Level B: Fair research evidence and supporting clinical consensus/ opinion	NR
Prescribed an antipsychotic	Schizophrenia	Discharged from a schizophrenia hospitalization with an antipsychotic prescription	CQAIMH	AHRQ Level A: Good research –based evidence	NR
Prescribed an atypical antipsychotic	Schizophrenia	Receiving an atypical antipsychotics (clozapine, olanzapine, risperidone, quetiapine, ziprasidone) during a specified period	CQAIMH Developer: National Association of State Mental Health Program Directors	AHRQ Level B: Fair research evidence and supporting clinical consensus/ opinion	NR

Table D-1. Identified quality measures for psychiatric care in key quality measure databases: Antipsychotic prescribed (continued)

Quality of Care Concern	Type of SMI	Full Quality Measure	Developer	Evidence for Measure	Use of Measure
Prescribed a depot antipsychotic	Schizophrenia	Patients receiving a depot antipsychotic who had reported noncompliance with their antipsychotic medication regimen	CQAIMH Developer: Lehman et al, 1998	AHRQ Level B: Fair research evidence and supporting clinical consensus/ opinion	NR
Prescribed an antipsychotic at the right dose at Discharge	Schizophrenia	Discharged from a schizophrenia hospitalization with an antipsychotic prescription at a dosage in the range of 300 to 600 chlorpromazine equivalents per day	CQAIMH Developer: Lehman et al., 1998	AHRQ Level A: Good research –based evidence	NR
Prescribed continuation antipsychotic	Schizophrenia	Discharged from a hospitalization and continued to receive an antipsychotic medication for the 12-month period following discharge	CQAIMH Developer: Lehman et al., 1998	AHRQ Level A: Good research –based evidence	NR
Prescribed an antipsychotic at the right dose	Schizophrenia	Discharged from a schizophrenia hospitalization using an antipsychotic prescription at a dosage less than 150 chlorpromazine equivalents for greater than 4 weeks	CQAIMH Developer: Popkin et al., 1998	AHRQ Level A: Good research –based evidence	NR
Documented rationale for outlier dosages of antipsychotic	Schizophrenia	All individuals 18 and older with a diagnosis of schizophrenia who are receiving antipsychotic medication at a dosage that is outside the recommended range (300 and 1,000 CPZ equivalents) at a specified point in time and whose medical record of the preceding 6 months provides documentation for the dosage used	CQAIMH	AHRQ Level B: Fair research evidence and supporting clinical consensus/ opinion	NR

Table D-1. Identified quality measures for psychiatric care in key quality measure databases: Antipsychotic prescribed (continued)

Quality of Care Concern	Type of SMI	Full Quality Measure	Developer	Evidence for Measure	Use of Measure
2 or more antipsychotics prescribed	Hospital- based inpatient psychiatric services (all ages, but can separate out adults)	Percentage of hospital-based inpatient psychiatric services: the percentage of patients discharged from a hospital-based inpatient psychiatric setting on two or more antipsychotic medications CMS: Patients discharged on multiple antipsychotic medications	Joint Commission (Core Measure) CQAIMH **NQF ENDORSED** (0552) NQMC: 007526 HBIPS-4 HHS:004856	A clinical practice guideline or other peer-reviewed synthesis of the clinical research evidence One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal	Accreditation Collaborative inter-organizational quality improvement Internal quality improvement Public reporting
Justification provided for prescribing 2 or more antipsychotics	Hospital-based inpatient psychiatric services (all age groups but can separate out adults)	Percentage discharged from a hospital-based inpatient psychiatric setting on two or more antipsychotic medications with appropriate justification CMS: Patients discharged on multiple antipsychotic medications with appropriate justification	Joint Commission (Core Measure) CQAIMH NQMC: 07527 HBIPS-5 HHS:004855	A clinical practice guideline or other peer-reviewed synthesis of the clinical research evidence One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal	Accreditation Care Coordination Collaborative inter-organizational quality improvement Public reporting

Table D-2. Quality measures used in studies for assessing psychiatric care: Antipsychotic prescribed or used

Quality of Care Concern	Type of SMI	Full Quality Measure	Developer	Data Source	Study Details
Prescribed antipsychotic	Inpatient or community mental health rehabilitation unit patients, mostly with schizophrenia	Number (%) of patients receiving typical and atypical psychotic medication	Killaspsy[1]	UK National Health Service Mental Health Trusts	Used a web-based toolkit (Quality Indicator for Rehabilitative Care [QuIRC]) reporting on seven domains of care, based on systematic review of effectiveness of components of care, a review of relevant international care standards and Delphi exercises with service users, practitioners, careers and advocates.
Prescribed antipsychotic	Schizophrenia	Any antipsychotic medication prescribed	Busch[2]	Medicaid Managed Behavioral Health Carve-Outs	Observational retrospective cohort study of ambulatory care Medicaid enrollees in carve-out and comparison regions
Prescribed antipsychotic	Schizophrenia	A first generation antipsychotic medication prescribed	Busch[2]	Medicaid Managed Behavioral Health Carve-Outs	Observational retrospective cohort study of ambulatory care Medicaid enrollees in carve-out and comparison regions
Prescribed antipsychotic	Schizophrenia	A second-generation antipsychotic medication (not including clozapine) prescribed	Busch[2]	Medicaid Managed Behavioral Health Carve-Outs	Observational retrospective cohort study of ambulatory care Medicaid enrollees in carve-out and comparison regions
Prescribed antipsychotic	Schizophrenia	Prescribed “anti-extrapyramidal symptom” medication, conditional on receiving a first-generation antipsychotic medication	Busch[2]	Medicaid Managed Behavioral Health Carve-Outs	Observational retrospective cohort study of ambulatory care Medicaid enrollees in carve-out and comparison regions
Prescribed antipsychotic	Schizophrenia	Clozapine prescribed	Busch[2]	Medicaid Managed Behavioral Health Carve-Outs	Observational retrospective cohort study of ambulatory care Medicaid enrollees in carve-out and comparison regions
Prescribed depot antipsychotics	Schizophrenia	Patients with episodic treatment using antipsychotic medication in the study period with a previous history of treatment nonresponse who are receiving depot antipsychotics	Watkins[3]	Veteran’s Health Administration	Report on developing medical record-based performance indicators to measure the quality of mental health care
Prescribed antipsychotic [Maintenance]	Schizophrenia	Proportion of schizophrenia patients with long-term utilization of antipsychotic medications	Lind[4]	New York Medicaid	Report on proposed future measures
Prescribed clozapine	Inpatient or community mental health rehabilitation unit patients, mostly with schizophrenia	Number (%) of patients receiving clozapine	Killaspy[1]	UK National Health Service Mental Health Trusts	Used a web-based toolkit (Quality Indicator for Rehabilitative Care [QuIRC]) reporting on seven domains of care, based on systematic review of effectiveness of components of care, a review of relevant international care standards and Delphi exercises with service users, practitioners, carers and advocates.

Table D-2. Quality measures used in studies for assessing psychiatric care: Antipsychotic prescribed or used (continued)

Quality of Care Concern	Type of SMI	Full Quality Measure	Developer	Data Source	Study Details
Prescribed clozapine	Schizophrenia	Number of treatment resistant patients with schizophrenia who were prescribed clozapine.	Simon[5]	NA	Report on developing quality measures for Medicaid Beneficiaries with schizophrenia
Prescribed antipsychotic	Schizophrenia	Use of antipsychotic medications for treatment of schizophrenia	Simon[5]	NA	Report on developing quality measures for Medicaid Beneficiaries with schizophrenia
Prescribed more than 1 antipsychotic	Psychosis	Median number of prescribed psychotropic medications at discharge (Adapted from the Joint Commission's 2005 Proposed Candidate Core Measure Set for hospital-based, inpatient psychiatric services)	Williams[6]	University Health System Consortium	Retrospective review of inpatient psychiatric records across member academic medical centers; performance measures adapted from consensus projects on important performance measures in mental health and clinical practice guidelines from organizations such as The Joint Commission, the National Quality Forum, and the American Psychiatric Association
Prescribed 2 or more antipsychotics	Inpatient or community mental health rehabilitation unit patients, mostly with schizophrenia	Number (%) of patients receiving >2 antipsychotic medications	Killaspsy[1]	UK National Health Service Mental Health Trusts	Used a web-based toolkit (Quality Indicator for Rehabilitative Care [QuIRC]) reporting on seven domains of care, based on systematic review of effectiveness of components of care, a review of relevant international care standards and Delphi exercises with service users, practitioners, carers and advocates.
Prescribed 2 or more antipsychotics	Psychosis	Patients discharged on 2 or more antipsychotic medications (Joint Commission: Hospital-Based Inpatient Psychiatric Services (HBIPS) Candidate Core Measure Set)	Williams[6]	University Health System Consortium	Retrospective review of inpatient psychiatric records across member academic medical centers; performance measures adapted from consensus projects on important performance measures in mental health and clinical practice guidelines from organizations such as The Joint Commission, the National Quality Forum, and the American Psychiatric Association
Prescribed more than 2 antipsychotics	Schizophrenia	Number of patients with schizophrenia who receive 3 or more antipsychotic medications in a unit of time	Simon[5]	NA	Report on developing quality measures for Medicaid Beneficiaries with schizophrenia
Prescribed antipsychotic at right dose	Mental health disorders	Percentage of patients taking antipsychotic receiving dosage within guideline-recommended range	Kilbourne[7]	NA	Framework for measuring quality and promoting accountability across silos: the case of mental disorder and co-occurring conditions

Table D-2. Quality measures used in studies for assessing psychiatric care: Antipsychotic prescribed or used (continued)

Quality of Care Concern	Type of SMI	Full Quality Measure	Developer	Data Source	Study Details
Prescribed antipsychotic at right dose	Schizophrenia, inpatient acute care	Is dose within the chlopromazine-equivalent accepted ranges (300-400 mg/day to 1000 mg/day)?	Owen[8,9]	Veterans Affairs medical Center, State hospital in southeastern U.S.	Measure derived from schizophrenia guidelines from the Schizophrenia Patient Outcomes Research Team recommendations; and the American Psychiatric Association
Use of antipsychotic medication	Schizophrenia	Beneficiaries with at least one claim for a antipsychotic	Brown[10]	NA	Report on evidence-based practice for Medicaid beneficiaries with schizophrenia and bipolar disorder
Continuity of antipsychotic	Schizophrenia	Number of beneficiaries for whom the total days" supply on all nonoverlapping antipsychotic fills was 80 percent or more of the days since their first fill for an antipsychotic	Brown[10]	NA	Report on evidence-based practice for Medicaid beneficiaries with schizophrenia and bipolar disorder
Monitoring for side effects of medication	Inpatient or community mental health rehabilitation unit patients, mostly with schizophrenia	Monitoring of therapeutic and side-effects of medication	Killaspsy[1]	UK National Health Service Mental Health Trusts	Used a web-based toolkit (Quality Indicator for Rehabilitative Care [QuIRC]) reporting on seven domains of care, based on systematic review of effectiveness of components of care, a review of relevant international care standards and Delphi exercises with service users, practitioners, carers and advocates.
Maintenance phase medication	Schizophrenia	Percentage of patients receiving an antipsychotic medication for acute symptoms and continued medication for a 12-month period after stabilization of the acute episode	Addington[11]	NA	Development of a core set of performance measures for evaluating schizophrenia treatment services (36 essential measures)
Relapse plan	Schizophrenia	Percentage of stable first-episode patients with a relapse monitoring plan in place after medication discontinuation	Addington[11]	NA	Development of a core set of performance measures for evaluating schizophrenia treatment services (36 essential measures)
Medication management support	Inpatient or community mental health rehabilitation unit patients, mostly with schizophrenia	Degree of support given to help patients manage medication	Killaspsy[1]	UK National Health Service Mental Health Trusts	Used a web-based toolkit (Quality Indicator for Rehabilitative Care [QuIRC]) reporting on seven domains of care, based on systematic review of effectiveness of components of care, a review of relevant international care standards and Delphi exercises with service users, practitioners, carers and advocates.

Table D-3. Identified quality measures for psychiatric care in key quality measure databases: Mood stabilizers (antimanic medications)

Quality of Care Concern	Type of SMI	Full Quality Measure	Developer	Evidence for Measure	Use of Measure
Prescribed an antimanic agent	Bipolar Disorder	Percentage of patients with newly diagnosed bipolar disorder who have received at least 1 prescription for a mood-stabilizing agent during the measurement year	**NQF Endorsed** (0580) Steward: Resolution Health, Inc.	NR	Public Reporting Quality Improvement (Internal to the specific organization)
Use of mood stabilizer	Bipolar Disorder	Use of mood stabilizers (lithium, valproic acid, or carbamazepine) in those with bipolar disorder, acute manic episode	CQAIMH Developer: American Psychiatric Association	AHRQ Level A. Good research-based evidence	NR
Use of mood stabilizer or antimanic agent	Bipolar Disorder	Percentage of patients with Bipolar I Disorder with depressive symptoms and behaviors who have evidence of use of a mood stabilizing or antimanic agent during the first 12 weeks of pharmacotherapy treatment	CQAIMH STABLE Project National Coordinating Council	A clinical practice guideline or other peer-reviewed synthesis of the clinical research evidence A formal consensus procedure, involving experts in relevant clinical, methodological, public health and organizational sciences One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal	Ambulatory/Office-based Care Behavioral Health Care
Use of agent with antimanic properties	Bipolar Disorder	Percentage of patients with Bipolar I Disorder with mania/hypomania, mixed or cycling symptoms and behaviors who have evidence of use of pharmacotherapy agent with antimanic properties during the first 12 weeks of treatment	CQAIMH STABLE Project National Coordinating Council	A clinical practice guideline or other peer-reviewed synthesis of the clinical research evidence A formal consensus procedure, involving experts in relevant clinical, methodological, public health and organizational sciences One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal	Internal quality improvement

Table D-3. Identified quality measures for psychiatric care in key quality measure databases: Mood stabilizers (antimanic medications) (continued)

Quality of Care Concern	Type of SMI	Full Quality Measure	Developer	Evidence for Measure	Use of Measure
Registry for those on lithium therapy	Schizophrenia, bipolar or other psychoses	Establishes and maintains a register of patients with schizophrenia, bipolar affective disorder and other psychoses and other patients on lithium therapy	British Medical Association	A clinical practice guideline or other peer-reviewed synthesis of the clinical research evidence A formal consensus procedure, involving experts in relevant clinical, methodological, public health and organizational sciences One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal	Internal quality improvement National reporting Pay-for-performance
Prescribed 4 or more psychotropic drugs	Schizophrenia	Discharged from a schizophrenia hospitalization or with two outpatient visits and a primary diagnosis of schizophrenia and prescribed an four or more psychotropic drugs for at least a month during the 12-month period	CQAIMH Developer: Popkin et al., 1998	AHRQ Level C: Little research evidence, principally based on clinical consensus/ opinion	NR

Table D-4. Identified quality measures for psychiatric care in key quality measure databases: Other medications for SMI (antidepressant, antianxiety, etc.)

Quality of Care Concern	Type of SMI	Full Quality Measure	Developer	Evidence for Measure	Use of Measure
Prescribed an antidepressant	Schizophrenia	Enrollees who had either one inpatient admission or two outpatient visits with a primary diagnosis of schizophrenia within a 12 month period and who received an antidepressant dosage below guideline-recommended thresholds for more than four weeks of the 12-month period. [Amitriptyline, 150mg; Amoxapine, 200mg; Buproprion, 225mg; Clomipramine, 125mg; Desipramine, 150mg; Doxepin, 150mg; Fluoxetine, 20mg; Imipramine, 150mg; Maprotiline, 150mg; Nortriptyline, 75mg; Protriptyline, 30mg; Trazadone, 200mg; Trimipramine, 150mg]	CQAIMH Developer: Popkin et al., 1998	AHRQ Level B: Fair research evidence and supporting clinical consensus/ opinion	NR
Prescribed an antidepressant at discharge	Schizophrenia	Discharged from a schizophrenia hospitalization or with two outpatient visits and a primary diagnosis of schizophrenia and prescribed an antidepressant in the guideline-recommended threshold	CQAIMH Developer: Popkin et al., 1998	AHRQ Level B: Fair research evidence and supporting clinical consensus/ opinion	NR
Prescribed an antidepressant	Bipolar Disorder	Percentage of patients with Bipolar I Disorder symptoms and behaviors who received monotherapy with an antidepressant agent during the first 12 weeks of treatment	CQAIMH STABLE Project National Coordinating Council	A clinical practice guideline or other peer-reviewed synthesis of the clinical research evidence A formal consensus procedure, involving experts in relevant clinical, methodological, public health and organizational sciences One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal	Internal quality improvement

Table D-4. Identified quality measures for psychiatric care in key quality measure databases: Other medications for SMI (antidepressant, antianxiety, etc.) (continued)

Quality of Care Concern	Type of SMI	Full Quality Measure	Developer	Evidence for Measure	Use of Measure
Prescribed an antianxiety medication	Schizophrenia	All patients, 18 years of age or older, with a current diagnosis of schizophrenia who report a current diagnosis of anxiety disorder or who have a current chart diagnosis of comorbid anxiety disorder at a specified point in time and who for whom the medical record documents prescription of either a benzodiazepine or propranolol	CQAIMH Developer: Lehman et al., 1998	AHRQ Level B: Fair research evidence and supporting clinical consensus/ opinion	NR

Table D-5. Quality measures used in studies for assessing psychiatric outcomes: Mood stabilizers (antimanic medications)

Quality of Care Concern	Type of SMI	Full Quality Measure	User of Measure for Study	Data Source	Study Details
Use of mood stabilizer medication	Bipolar Disorder	Beneficiaries with at least one claim for lithium, anticonvulsant, or antipsychotic	Brown[10]	NA	Report on evidence-based practice for Medicaid beneficiaries with schizophrenia and bipolar disorder
Prescribed mood stabilizer	Bipolar Disorder	Proportion of patients with bipolar 1 disorder treated with mood stabilizer medications during course of bipolar 1 disorder treatment	Lind[4]	New York Medicaid	Report on proposed future measures
Prescribed a mood stabilizer	Bipolar Disorder	Proportion of patients with bipolar disorder experiencing a mild to moderate manic episode who receive monotherapy with lithium, valproate or a second generation antipsychotic such as olanzapine	Duffy[12]	NA	Proposed quality of care measures for the treatment of bipolar disorder, based on APA, American Institute for Research and Education and national panel of experts in bipolar disorder and practice guideline development
Prescribed a mood stabilizer	Bipolar Disorder	Proportion of patients with bipolar disorder experiencing a severe manic episode, receiving either lithium, valproate or an antipsychotic	Duffy[12]	NA	Proposed quality of care measures for the treatment of bipolar disorder, based on APA, American Institute for Research and Education and national panel of experts in bipolar disorder and practice guideline development
Prescribed a mood stabilizer	Bipolar Disorder	Proportion of patients with bipolar disorder experiencing a mild to moderate mixed episode receiving monotherapy with lithium, valproate or a second generation antipsychotic such as olanzapine	Duffy[12]	NA	Proposed quality of care measures for the treatment of bipolar disorder, based on APA, American Institute for Research and Education and national panel of experts in bipolar disorder and practice guideline development
Prescribed a mood stabilizer	Bipolar Disorder	Proportion of patients with bipolar disorder experiencing a severe mixed episode, receiving either valproate and an antipsychotic or lithium and an antipsychotic	Duffy[12]	NA	Proposed quality of care measures for the treatment of bipolar disorder, based on APA, American Institute for Research and Education and national panel of experts in bipolar disorder and practice guideline development
Prescribed a mood stabilizer	Bipolar Disorder	Proportion of patients in an acute depressive episode of bipolar disorder receiving either lithium or lamotrigine	Duffy[12]	NA	Proposed quality of care measures for the treatment of bipolar disorder, based on APA, American Institute for Research and Education and national panel of experts in bipolar disorder and practice guideline development

Table D-5. Quality measures used in studies for assessing psychiatric outcomes: Mood stabilizers (antimanic medications) (continued)

Quality of Care Concern	Type of SMI	Full Quality Measure	User of Measure for Study	Data Source	Study Details
Prescribed a mood stabilizer	Bipolar Disorder	Proportion of patients with bipolar disorder who are experiencing rapid cycling, receiving lithium, valproate or as an alternative lamotrigine	Duffy[12]	NA	Proposed quality of care measures for the treatment of bipolar disorder, based on APA, American Institute for Research and Education and national panel of experts in bipolar disorder and practice guideline development
Mood stabilizer at optimized dose	Bipolar Disorder	Proportion of patients with bipolar disorder experiencing a manic, mixed or depressive episode during the maintenance phase of treatment (i.e., a "breakthrough episode"), who are receiving an optimized dose of medication compared with the dose used before the onset of breakthrough episode	Duffy[12]	NA	Proposed quality of care measures for the treatment of bipolar disorder, based on APA, American Institute for Research and Education and national panel of experts in bipolar disorder and practice guideline development
Psychotropics at discharge	Psychosis	Median number of prescribed psychotropic medications at discharge	Williams[6]	University Health System Consortium	Retrospective review of inpatient psychiatric records across member academic medical centers; performance measures adapted from consensus projects on important performance measures in mental health and clinical practice guidelines from organizations such as The Joint Commission, the National Quality Forum, and the American Psychiatric Association
Mood Stabilizer Prescribed [Maintenance]	Bipolar Disorder	Percent of patients included in the study who are in continuous treatment with mood stabilizer medication	Watkins[3]	Veteran's Health Administration	Report on developing medical record-based performance indicators to measure the quality of mental health care
Mood Stabilizer Prescribed [Maintenance]	Bipolar Disorder	Percent of patients included in the study who are in intermittent treatment with mood stabilizer medication	Watkins[3]	Veteran's Health Administration	Report on developing medical record-based performance indicators to measure the quality of mental health care

Table D-6. Quality measures used in studies for assessing psychiatric outcomes: Other medications for SMI (antidepressant, antianxiety etc.)

Quality of Care Concern	Type of SMI	Full Quality Measure	User of Measure for Study	Data Source	Study Details
Prescribed an antidepressant	Bipolar Disorder	Proportion of patients with a manic or mixed episode of bipolar disorder, no longer receiving an antidepressant, or who are receiving a lower dose of antidepressants(s) compared with the dose before the onset of the manic or mixed episode	Duffy[12]	NA	Proposed quality of care measures for the treatment of bipolar disorder, based on APA, American Institute for Research and Education and national panel of experts in bipolar disorder and practice guideline development

Table D-7. Identified quality measures for psychiatric care in key quality measure databases: Medication adherence

Quality of Care Concern	Type of SMI	Full Quality Measure	Developer	Evidence for Measure	Use of Measure
Adherence to antipsychotic	Schizophrenia, schizo-affective disorder	Percentage of members 19 to 64 years of age with schizophrenia during the measurement year who were dispensed and remained on an antipsychotic medication for at least 80 percent of their treatment period NQF wording: Percentage of individuals 18 years of age or greater as of the beginning of the measurement period with schizophrenia or schizoaffective disorder who are prescribed an antipsychotic medication, with adherence to the antipsychotic medication [defined as a Proportion of Days Covered (PDC)] of at least 0.8 during the measurement period (12 consecutive months)	NCQA **NQF ENDORSED** (1879) HEDIS	A formal consensus procedure, involving experts in relevant clinical, methodological, public health and organizational sciences One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal	Accreditation Decisionmaking by businesses about health plan purchasing Decisionmaking by consumers about health plan/provider choice External oversight/Medicaid External oversight/State government program Internal quality improvement
Noncompliance with antipsychotic prescribed a depot antipsychotic	Schizophrenia	Patients, 18 years of age or older, with a current diagnosis of schizophrenia and a current prescription for antipsychotic medications who report noncompliance with their medication regimen and who are receiving depot antipsychotic medication	CQAIMH Developer: Lehman et al., 1998	AHRQ Level B: Fair research evidence and supporting clinical consensus/ opinion	NR

Table D-8. Quality measures used in studies for assessing psychiatric outcomes: Medication adherence

Quality of Care Concern	Type of SMI	Full Quality Measure	User of Measure for Study	Data Source	Study Details
Continuity of antipsychotic	Schizophrenia	Number of days in measurement year with a an antipsychotic prescription filled Number of patients with a gap in prescription refills	Simon[5]	NA	Report on developing quality measures for Medicaid Beneficiaries with schizophrenia
Continuity of medications	Bipolar Disorder	Number of beneficiaries for whom the total days supply on all nonoverlapping lithium, anticonvulsant, or antipsychotic fills was 80 percent or more of the days since their first fill for one of those medications	Brown[10]	NA	Report on evidence-based practice for Medicaid beneficiaries with schizophrenia and bipolar disorder

Table D-9. Identified quality measures for psychiatric care in key quality measure databases: Medication monitoring for side effects and medication levels

Quality of Care Concern	Type of SMI	Quality Measure (process)	Developer	Evidence for Measure	Use of Measure
Follow up visits for medications	Schizophrenia	Patients who had at least 4 medication management or psychotherapy visits with a psychiatrist	CQAIMH Developer: Lehman et al, 1998	AHRQ Level B: Fair research evidence and supporting clinical consensus/ opinion	NR
Blood level monitoring	Bipolar Disorder and other conditions	Number of members enrolled in a health plan, age 18 to 64, with two or more service-based claims for bipolar disorder and at least one claim for Lithium, valproic acid, or carbamazepine in at least three out of four quarters (the same drug in each quarter) of a 12-month period, excluding those individuals who were hospitalized for 30 or more days during the same 12-month period and who have received serum drug level monitoring for a mood stabilizer at least once during a 12 month period	CQAIMH Developer: Marcus et al., 1999	AHRQ Level B: Fair research evidence and supporting clinical consensus/ opinion	NR
Lithium serum medication level measured	Bipolar Disorder	Percentage of patients diagnosed with bipolar disorder and treated with lithium who have evidence of a lithium serum medication level within 12 weeks of beginning treatment	CQAIMH STABLE Project National Coordinating Council	A clinical practice guideline or other peer-reviewed synthesis of the clinical research evidence A formal consensus procedure, involving experts in relevant clinical, methodological, public health and organizational sciences One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal	Internal quality improvement

Table D-9. Identified quality measures for psychiatric care in key quality measure databases: Medication monitoring for side effects and medication levels (continued)

Quality of Care Concern	Type of SMI	Quality Measure (process)	Developer	Evidence for Measure	Use of Measure
Lithium at right dosage	Schizophrenia, bipolar or other psychoses	Percentage of patients on lithium therapy with a record of lithium levels in therapeutic range in the preceding 4 months	British Medical Association	A clinical practice guideline or other peer-reviewed synthesis of the clinical research evidence A formal consensus procedure, involving experts in relevant clinical, methodological, public health and organizational sciences	Internal quality improvement National reporting Pay-for-performance
Symptom monitoring	Schizophrenia	Proportion of patients who have neurologic side effects	The Danish National Schizophrenia Registry	AHRQ Level B: Fair research evidence and supporting clinical consensus/ opinion A formal consensus procedure, involving experts in relevant clinical, methodological, public health and organizational sciences	Accreditation Collaborative inter-organizational quality improvement Decisionmaking by consumers about health plan/provider choice Decisionmaking by managers about resource allocation External oversight/Regional, county, or city agencies External oversight/State government program Internal quality improvement National reporting Quality of care research

Table D-9. Identified quality measures for psychiatric care in key quality measure databases: Medication monitoring for side effects and medication levels (continued)

Quality of Care Concern	Type of SMI	Quality Measure (process)	Developer	Evidence for Measure	Use of Measure
Symptom monitoring	Schizophrenia	Proportion of patients who have sexual side effects	The Danish National Schizophrenia Registry	AHRQ Level B: Fair research evidence and supporting clinical consensus/ opinion A formal consensus procedure, involving experts in relevant clinical, methodological, public health and organizational sciences	Accreditation Collaborative inter-organizational quality improvement Decisionmaking by consumers about health plan/provider choice Decisionmaking by managers about resource allocation External oversight/Regional, county, or city agencies External oversight/State government program Internal quality improvement National reporting Quality of care research
Symptom monitoring	Schizophrenia	Proportion of patients who have sleeping and sedation side effects	The Danish National Schizophrenia Registry	AHRQ Level B: Fair research evidence and supporting clinical consensus/ opinion A formal consensus procedure, involving experts in relevant clinical, methodological, public health and organizational sciences	Accreditation Collaborative inter-organizational quality improvement Decisionmaking by consumers about health plan/provider choice Decisionmaking by managers about resource allocation External oversight/Regional, county, or city agencies External oversight/State government program Internal quality improvement National reporting Quality of care research

Table D-9. Identified quality measures for psychiatric care in key quality measure databases: Medication monitoring for side effects and medication levels (continued)

Quality of Care Concern	Type of SMI	Quality Measure (process)	Developer	Evidence for Measure	Use of Measure
Symptom monitoring	Schizophrenia	Proportion of patients who have weight gain as a side effect	The Danish National Schizophrenia Registry	AHRQ Level B: Fair research evidence and supporting clinical consensus/ opinion A formal consensus procedure, involving experts in relevant clinical, methodological, public health and organizational sciences	Accreditation Collaborative inter-organizational quality improvement Decisionmaking by consumers about health plan/provider choice Decisionmaking by managers about resource allocation External oversight/Regional, county, or city agencies External oversight/State government program Internal quality improvement National reporting Quality of care research
Symptom monitoring	Bipolar Disorder	Percentage of patients diagnosed with bipolar disorder and treated with an antipsychotic agent who were assessed for the presence of extrapyramidal symptoms twice within the first 24 weeks of treatment	CQAIMH STABLE Project National Coordinating Council	A clinical practice guideline or other peer-reviewed synthesis of the clinical research evidence A formal consensus procedure, involving experts in relevant clinical, methodological, public health and organizational sciences One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal	Internal quality improvement

Table D-9. Identified quality measures for psychiatric care in key quality measure databases: Medication monitoring for side effects and medication levels (continued)

Quality of Care Concern	Type of SMI	Quality Measure (process)	Developer	Evidence for Measure	Use of Measure
Side effect monitoring	Bipolar Disorder and other conditions	Number of members enrolled in a health plan, age 18 to 64, with two or more service-based claims for bipolar disorder and at least one claim for Lithium, valproic acid, or carbamazepine in at least three out of four quarters (the same drug in each quarter) of a 12-month period, excluding those individuals who were hospitalized for 30 or more days during the same 12-month period and who have undergone complete blood count (valproate/carbamazepine), liver (valproate/carbamazepine), thyroid and renal function testing (Lithium) at least once in the 12 month period	CQAIMH Developer: Marcus et al., 1999	AHRQ Level B: Fair research evidence and supporting clinical consensus/ opinion	NR
Medication dosage change due to symptoms	Schizophrenia, schizo-affective disorder	Consumers with akathisia and extrapyramidal symptoms who have one of the following: reduction in antipsychotic dose, switch to different antipsychotic, addition of a beta blocker, benzodiazepines, anticholinergic, or antiparkinson; or offered an atypical antipsychotic	CQAIMH Developer: Young et al, 1998	AHRQ Level A. Good research-based evidence	NR
Treatment of drug-related EPS	Schizophrenia	Patients, 18 years of age or older, with a diagnosis of schizophrenia receiving antipsychotic medication who report on a survey that they experience extrapyramidal symptoms and who have received a prescription for an anti-Parkinson medication	CQAIMH Developer: Lehman et al., 1998	AHRQ Level B: Fair research evidence and supporting clinical consensus/ opinion	NR

Table D-9. Identified quality measures for psychiatric care in key quality measure databases: Medication monitoring for side effects and medication levels (continued)

Quality of Care Concern	Type of SMI	Quality Measure (process)	Developer	Evidence for Measure	Use of Measure
Treatment of tardive dyskinesia	Schizophrenia	Consumers, between the ages of 18 and 65, with a diagnosis of schizophrenia or schizoaffective disorder who have been in treatment for at least 3 months, spent nor more than 21 days in the hospital during the previous 3 months, have had at least 1 visit with a psychiatrist during the 3 month period and have significant TD as indicated by the Abnormal Involuntary Movement Scale and who had a reduction in antipsychotic dosage during the 3-month period or have been offered treatment with clozapine	CQAIMH Developer: Young et al., 1998	AHRQ Level B: Fair research evidence and supporting clinical consensus/ opinion	NR
Medication change due to psychotic symptoms	Schizophrenia or schizoaffective disorder	Patients who have had at least 1 visit with a psychiatrist and no more than 21 days in the hospital, and have had significant psychotic symptoms based on Brief Psychiatric Rating Scale, and who have had a change in antipsychotic drug or dosage or were offered treatment with clozapine	CQAIMH Developer: Young et al, 1998	AHRQ Level A. Good research-based evidence	NR

Table D-10. Quality measures used in studies for assessing psychiatric outcomes: Medication monitoring for side effects and medication levels

Quality of Care Concern	Type of SMI	Full Quality Measure	User of Measure for Study	Data Source	Study Details
Lithium blood levels	Schizophrenia, bipolar disorder	Beneficiaries with at least one claim during the study period for lithium level screening	Brown[10]	NA	Report on evidence-based practice for Medicaid beneficiaries with schizophrenia and bipolar disorder
Anticonvulsant blood levels	Schizophrenia, bipolar disorder	Beneficiaries with at least one claim during the study period for valproate or carbamazepine level screening	Brown[10]	NA	Report on evidence-based practice for Medicaid beneficiaries with schizophrenia and bipolar disorder
Side effect monitoring	Schizophrenia	Percentage of patients on antipsychotic medication evaluated for side effects	Addington[11]	NA	Development of a core set of performance measures for evaluating schizophrenia treatment services (36 essential measures)
Side effect monitoring	Bipolar Disorder	Percent of patients in a new treatment episode with assessment of medication side effects (weight/BMI, akathesia) 2–4 months following the initiation of an antipsychotic or mood stabilizer	Watkins[3]	Veteran's Health Administration	Report on developing medical record-based performance indicators to measure the quality of mental health care
Extrapyramidal symptoms	Bipolar Disorder	Record side effects from medications (monitor extrapyramidal symptoms)	Kilbourne[13] used STABLE Project National Coordinating Council, RAND and APA measures	Veteran's Health Administration	Cross-sectional, cumulative data to 2 years prior to assessment
Extrapyramidal symptoms	Schizophrenia	Percentage of patients with extrapyramidal side effects who receive treatment for extrapyramidal symptoms	Addington[11]	NA	Development of a core set of performance measures for evaluating schizophrenia treatment services (36 essential measures)
Monitoring for side effects	Inpatient or community mental health rehabilitation unit patients, mostly with schizophrenia	Monitoring of therapeutic and side-effects of medication	Killaspy[1]	UK National Health Service Mental Health Trusts	Used a web-based toolkit (Quality Indicator for Rehabilitative Care [QuIRC]) reporting on seven domains of care, based on systematic review of effectiveness of components of care, a review of relevant international care standards and Delphi exercises with service users, practitioners, carers and advocates.

Table D-11. Quality measures used in studies for assessing psychiatric outcomes: Symptom and function monitoring

Quality of Care Concern	Type of SMI	Full Quality Measure	User of Measure for Study	Data Source	Study Details
Symptom monitoring	Bipolar Disorder	Percentage of patients diagnosed and treated for bipolar disorder who are monitored for change in their symptom complex within 12 weeks of initiating treatment	CQAIMH STABLE Project National Coordinating Council	A clinical practice guideline or other peer-reviewed synthesis of the clinical research evidence A formal consensus procedure, involving experts in relevant clinical, methodological, public health and organizational sciences One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal	Internal quality improvement

Table D-11. Quality measures used in studies for assessing psychiatric outcomes: Symptom and function monitoring (continued)

Quality of Care Concern	Type of SMI	Full Quality Measure	User of Measure for Study	Data Source	Study Details
Function monitoring	Bipolar Disorder	NQF: Percentage of patients treated for bipolar disorder with evidence of level-of-function evaluation at the time of the initial assessment and again within 12 weeks of initiating treatment CQAIMH: Percentage of patients diagnosed and treated for bipolar disorder who are monitored for change in their level-of-functioning in response to treatment within 12 weeks of initiating treatment Patients monitored for change in their level-of-functioning in response to treatment	CQAIMH STABLE Project National Coordinating Council **NQF ENDORSED** (0112)	A clinical practice guideline or other peer-reviewed synthesis of the clinical research evidence A formal consensus procedure, involving experts in relevant clinical, methodological, public health and organizational sciences One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal	Public Reporting Quality Improvement (Internal to the specific organization), Quality Improvement with Benchmarking (external benchmarking to multiple organizations), Regulatory and Accreditation Programs

Table D-12. Quality measures used in studies for assessing psychiatric outcomes: Symptom and function monitoring

Quality of Care Concern	Type of SMI	Full Quality Measure	User of Measure for Study	Data Source	Study Details
Symptom monitoring	Bipolar Disorder	Monitored for change in their symptom complex (assess psychotic, hallucinatory and delusional symptoms)	Kilbourne[13] used STABLE Project National Coordinating Council measure	Veteran's Health Administration	Cross-sectional, cumulative data to 2 years prior to assessment

Table D-13. Identified quality measures for psychiatric care in key quality measure databases: Screening for risk of suicide

Quality of Care Concern	Type of SMI	Full Quality Measure	Developer	Evidence for Measure	Use of Measure
Risk of violence to self and others	Hospital-based inpatient psychiatric services (all age groups but can separate out adults)	Percentage of patients admitted to a hospital-based inpatient psychiatric setting who are screened within the first three days of admission for all of the following: risk of violence to self or others, substance use, psychological trauma history and patient strengths	Joint Commission (Core Measure) NQMC: 007527	A clinical practice guideline or other peer-reviewed synthesis of the clinical research evidence One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal	Accreditation Collaborative inter-organizational quality improvement Internal quality improvement
Risk of suicide	Bipolar Disorder	Percentage of patients with bipolar disorder with evidence of an initial assessment that includes an appraisal for risk of suicide	CQAIMH STABLE Project National Coordinating Council **NQF ENDORSED** (0111)	A clinical practice guideline or other peer-reviewed synthesis of the clinical research evidence A formal consensus procedure, involving experts in relevant clinical, methodological, public health and organizational sciences One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal	Public Reporting Quality Improvement (Internal to the specific organization) Quality Improvement with Benchmarking (external benchmarking to multiple organizations) Regulatory and Accreditation Programs

Table D-13. Identified quality measures for psychiatric care in key quality measure databases: Screening for risk of suicide (continued)

Quality of Care Concern	Type of SMI	Full Quality Measure	Developer	Evidence for Measure	Use of Measure
Risk of suicide	Schizophrenia	Proportion of hospitalized patients assessed for suicide risk (documented in patient record) at discharge	The Danish National Schizophrenia Registry	AHRQ Level B: Fair research evidence and supporting clinical consensus/ opinion A formal consensus procedure, involving experts in relevant clinical, methodological, public health and organizational sciences	Accreditation Collaborative inter-organizational quality improvement Decisionmaking by consumers about health plan/provider choice Decisionmaking by managers about resource allocation External oversight/Regional, county, or city agencies External oversight/State government program Internal quality improvement National reporting Quality of care research

Table D-14. Quality measures used in studies for assessing psychiatric outcomes: Screening for risk of suicide

Quality of Care Concern	Type of SMI	Full Quality Measure	User of Measure for Study	Data Source	Study Details
Suicide risk	Bipolar Disorder	Assess suicidal ideation	Kilbourne[13] used STABLE Project and APA guidelines	Veteran's Health Administration	Cross-sectional, cumulative data to 2 years prior to assessment
Suicide rate	Schizophrenia	Number of suicides divided by number of patient-treated years Number of suicide attempts divided by number of patient-treated years	Addington[11]	NA	Development of a core set of performance measures for evaluating schizophrenia treatment services (36 essential measures)

Table D-15. Identified quality measures for psychiatric care in key quality measure databases: Co-occurring substance use

Quality of Care Concern	Type of SMI	Full Quality Measure	Developer	Evidence for Measure	Use of Measure
Substance use	Schizophrenia	Patients admitted to a hospital whose inpatient admission or discharge assessment indicates the presence of a recent (< 30 days) history of substance abuse or dependence and includes a referral to substance abuse treatment or documentation that the patient refused substance abuse treatment	CQAIMH (Dickey et al, in press)	AHRQ Level B: Fair research evidence and supporting clinical consensus/ opinion	NR
Alcohol use	Schizophrenia, bipolar or other psychoses	Percentage of patients with schizophrenia, bipolar affective disorder and other psychoses who have a record of alcohol consumption in the preceding 12 months	British Medical Association	A clinical practice guideline or other peer-reviewed synthesis of the clinical research evidence A formal consensus procedure, involving experts in relevant clinical, methodological, public health and organizational sciences One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal	Internal quality improvement National reporting Pay-for-performance

Table D-15. Identified quality measures for psychiatric care in key quality measure databases: Co-occurring substance use (continued)

Quality of Care Concern	Type of SMI	Full Quality Measure	Developer	Evidence for Measure	Use of Measure
Alcohol and chemical substance use	Bipolar Disorder	Percentage of patients with depression or bipolar disorder with evidence of an initial assessment that includes an appraisal for alcohol and chemical substance use CMS: Bipolar disorder and major depression: Appraisal for alcohol or chemical substance use.	CQAIMH STABLE Project National Coordinating Council **NQF ENDORSED** (0110) NQMC:003493 HHS:004910	A clinical practice guideline or other peer-reviewed synthesis of the clinical research evidence A formal consensus procedure, involving experts in relevant clinical, methodological, public health and organizational sciences One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal	Public Reporting Quality Improvement (Internal to the specific organization) Quality Improvement with Benchmarking (external benchmarking to multiple organizations) Regulatory and Accreditation Programs Pay-for-reporting
Substance use	Hospital-based inpatient psychiatric services (all age groups but can separate out adults)	Percentage of patients admitted to a hospital-based inpatient psychiatric setting who are screened within the first three days of admission for all of the following: risk of violence to self or others, substance use, psychological trauma history and patient strengths	Joint Commission (Core Measure) NQMC: 007527	A clinical practice guideline or other peer-reviewed synthesis of the clinical research evidence One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal	Accreditation Collaborative inter-organizational quality improvement Internal quality improvement

Table D-16. Quality measures used in studies for assessing psychiatric outcomes: Co-occurring substance use

Quality of Care Concern	Type of SMI	Full Quality Measure	User of Measure for Study	Data Source	Study Details
Illicit drug use	Bipolar Disorder	Assess illicit drug use	Kilbourne[13] Used STABLE Project and RAND measures	Veteran's Health Administration	Cross-sectional, cumulative data to 2 years prior to assessment
Alcohol use	Bipolar Disorder	Assess alcohol use	Kilbourne[13] Used STABLE Project and RAND measures	Veteran's Health Administration	Cross-sectional, cumulative data to 2 years prior to assessment
Drug and alcohol screening	Psychosis	Drug and alcohol abuse screening at the initial evaluation for psychiatric disorder	Williams[6]	University Health System Consortium	Retrospective review of inpatient psychiatric records across member academic medical centers; performance measures adapted from consensus projects on important performance measures in mental health and clinical practice guidelines from organizations such as The Joint Commission, the National Quality Forum, and the American Psychiatric Association
Substance use screening	Mental health disorders	Percentage of patients in mental health programme have documented substance use screening	Kilbourne[7]	NA	Framework for measuring quality and promoting accountability across silos: the case of mental disorder and co-occurring conditions
Substance use	Schizophrenia	Percentage of patients admitted with a diagnosis of schizophrenia receiving an assessment of substance misuse	Addington[11]	NA	Development of a core set of performance measures for evaluating schizophrenia treatment services (36 essential measures)
Substance use screening or counseling service	Schizophrenia	Patients with schizophrenia who have co-occurring substance use disorder who receive a screening or counseling service for substance use disorder in the measurement year	Simon[5]	NA	Report on developing quality measures for Medicaid Beneficiaries with schizophrenia
Drug and alcohol detailed assessment	Psychosis	Detailed assessment of drug and alcohol abuse if screening positive for drug/alcohol use	Williams[6]	University Health System Consortium	Retrospective review of inpatient psychiatric records across member academic medical centers; performance measures adapted from consensus projects on important performance measures in mental health and clinical practice guidelines from organizations such as The Joint Commission, the National Quality Forum, and the American Psychiatric Association

Table D-16. Quality measures used in studies for assessing psychiatric outcomes: Co-occurring substance use (continued)

Quality of Care Concern	Type of SMI	Full Quality Measure	User of Measure for Study	Data Source	Study Details
Alcohol and chemical substance use	Bipolar Disorder	Percent of patients with a new treatment episode with initial assessment that includes appraisal for alcohol and chemical substance use	Watkins[3]	Veteran's Health Administration	Report on developing medical record-based performance indicators to measure the quality of mental health care
Substance abuse assessment	Schizophrenia, Bipolar, MDD, Substance use disorder, PTSD	Assessment of substance use disorder, trauma, and patient strengths completed for inpatients whose first hospitalization of the study period: (1) Presence of co-occurring substance use disorder (Not Included in Substance Use Disorder Diagnosis) and (2) History of psychological trauma and contribution of trauma to current presentation (Not Included in PTSD Diagnosis) and (3) Patient strengths	Watkins[3]	Veterans Health Administration	Report on developing medical record-based performance indicators to measure the quality of mental health care
Substance use program	Mental health disorders	Percentage of patients in substance use programme engaged in care (e.g., two outpatient visits within 14 days)	Kilbourne[7]	NA	Framework for measuring quality and promoting accountability across silos: the case of mental disorder and co-occurring conditions
Treatment plan for substance abuse	Psychosis	A treatment plan that reflects substance abuse treatment goals	Williams[6]	University Health System Consortium	Retrospective review of inpatient psychiatric records across member academic medical centers; performance measures adapted from consensus projects on important performance measures in mental health and clinical practice guidelines from organizations such as The Joint Commission, the National Quality Forum, and the American Psychiatric Association

Table D-16. Quality measures used in studies for assessing psychiatric outcomes: Co-occurring substance use (continued)

Quality of Care Concern	Type of SMI	Full Quality Measure	User of Measure for Study	Data Source	Study Details
Aftercare plan for substance abuse	Psychosis	An aftercare plan that addresses substance use/abuse	Williams[6]	University Health System Consortium	Retrospective review of inpatient psychiatric records across member academic medical centers; performance measures adapted from consensus projects on important performance measures in mental health and clinical practice guidelines from organizations such as The Joint Commission, the National Quality Forum, and the American Psychiatric Association
Tobacco use	Bipolar Disorder	Assess tobacco use	Kilbourne[13] used RAND measures	Veteran's Health Administration	Cross-sectional, cumulative data to 2 years prior to assessment

Table D-17. Identified quality measures for psychiatric care in key quality measure databases: Comorbid depression and anxiety, PTSD

Quality of Care Concern	Type of SMI	Full Quality Measure	Developer	Evidence for Measure	Use of Measure
Assessed for depression prior to treatment	Bipolar and Major Depression	Percentage of patients presenting with depression who were assessed, prior to the initiation of treatment, for the presence of prior or current symptoms and/or behaviors associated with mania or hypomania	CQAIMH STABLE Project National Coordinating Council **NQF ENDORSED** (0109)	A clinical practice guideline or other peer-reviewed synthesis of the clinical research evidence A formal consensus procedure, involving experts in relevant clinical, methodological, public health and organizational sciences One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal	Public Reporting Quality Improvement (Internal to the specific organization) Quality Improvement with Benchmarking (external benchmarking to multiple organizations) Regulatory and Accreditation Programs

Table D-18. Quality measures used in studies for assessing psychiatric outcomes: Comorbid depression and anxiety, PTSD

Quality of Care Concern	Type of SMI	Full Quality Measure	User of Measure for Study	Data Source	Study Details
Assessment of depression	Schizophrenia	Percentage of patients receiving an assessment of depressive symptoms at intake (as measured with a structured scale)	Addington[11]	NA	Development of a core set of performance measures for evaluating schizophrenia treatment services (36 essential measures)
PTSD	Bipolar Disorder	Assess PTSD	Kilbourne[13] used RAND measures	Veteran's Health Administration	Cross-sectional, cumulative data to 2 years prior to assessment

Table D-19. Identified quality measures for psychiatric care in key quality measure databases: Early detection, lack of treatment

Quality of Care Concern	Type of SMI	Quality Measure (process)	Developer	Evidence for Measure	Use of Measure
Lack of treatment	Schizophrenia	Duration of untreated psychosis before treatment	The Danish National Schizophrenia Registry	AHRQ Level B: Fair research evidence and supporting clinical consensus/ opinion A formal consensus procedure, involving experts in relevant clinical, methodological, public health and organizational sciences	Accreditation Collaborative inter-organizational quality improvement Decisionmaking by consumers about health plan/provider choice Decisionmaking by managers about resource allocation External oversight/Regional, county, or city agencies External oversight/State government program Internal quality improvement National reporting Quality of care research

Table D-20. Quality measures used in studies for assessing psychiatric outcomes: Early detection, lack of treatment

Quality of Care Concern	Type of SMI	Full Quality Measure	User of Measure for Study	Data Source	Study Details
Early detection of psychotic symptoms	Schizophrenia	Percentage of individuals with first-episode psychosis detected within 6 months of onset of psychotic symptoms	Addington[11]	NA	Development of a core set of performance measures for evaluating schizophrenia treatment services (36 essential measures)
Early detection of SMI	Schizophrenia, paranoid and other psychoses, organic brain syndrome, or major affective disorder (meeting disability and duration criteria)	In-patient admission on detection of SMI	Charlwood[14]	NA	Report on the development and final recommendations for outcome indicators for severe mental illness for the UK from their National Centre for Health Outcomes Development
Lost-to followup	Schizophrenia, paranoid and other psychoses, organic brain syndrome, or major affective disorder (meeting disability and duration criteria)	Proportion of people with SMI lost to followup by specialist services	Charlwood[14]	NA	Report on the development and final recommendations for outcome indicators for severe mental illness for the UK from their National Centre for Health Outcomes Development
Patients no longer in treatment	Bipolar Disorder	Percent of patients included in the study who are lost to followup or leave treatment against medical advice	Watkins[3]	Veteran's Health Administration	Report on developing medical record-based performance indicators to measure the quality of mental health care

Table D-21. Identified quality measures for psychiatric care in key quality measure databases: Assessment for psychopathy and cognitive functioning

Quality of Care Concern	Type of SMI	Full Quality Measure	Developer	Evidence for Measure	Use of Measure
Psychopathy exam	Schizophrenia	Proportion of incident (diagnosed within 12 months of contact) patients examined for psychopathology by a medical specialist	The Danish National Schizophrenia Registry	AHRQ Level B: Fair research evidence and supporting clinical consensus/ opinion A formal consensus procedure, involving experts in relevant clinical, methodological, public health and organizational sciences	Accreditation Collaborative inter-organizational quality improvement Decisionmaking by consumers about health plan/provider choice Decisionmaking by managers about resource allocation External oversight/Regional, county, or city agencies External oversight/State government program Internal quality improvement National reporting Quality of care research
Use of diagnostic instruments for assessment	Schizophrenia	Proportion of incident (diagnosed within 12 months of contact) patients examined for psychopathology by a specialist where the assessment is done using a diagnostic instrument (SCAN, OPCRIT, SCID)	The Danish National Schizophrenia Registry	AHRQ Level B: Fair research evidence and supporting clinical consensus/ opinion A formal consensus procedure, involving experts in relevant clinical, methodological, public health and organizational sciences	Accreditation Collaborative inter-organizational quality improvement Decisionmaking by consumers about health plan/provider choice Decisionmaking by managers about resource allocation External oversight/Regional, county, or city agencies External oversight/State government program Internal quality improvement National reporting Quality of care research

Table D-21. Identified quality measures for psychiatric care in key quality measure databases: Assessment for psychopathy and cognitive functioning (continued)

Quality of Care Concern	Type of SMI	Full Quality Measure	Developer	Evidence for Measure	Use of Measure
Cognitive function	Schizophrenia	Proportion of incident (diagnosed within 12 months of contact) patients for which cognitive function was examined by a psychologist	The Danish National Schizophrenia Registry	AHRQ Level B: Fair research evidence and supporting clinical consensus/ opinion A formal consensus procedure, involving experts in relevant clinical, methodological, public health and organizational sciences	Accreditation Collaborative inter-organizational quality improvement Decisionmaking by consumers about health plan/provider choice Decisionmaking by managers about resource allocation External oversight/Regional, county, or city agencies External oversight/State government program Internal quality improvement National reporting Quality of care research

Table D-22. Quality measures used in studies for assessing psychiatric outcomes: Assessment for psychopathy and cognitive functioning

Quality of Care Concern	Type of SMI	Full Quality Measure	User of Measure for Study	Data Source	Study Details
NO STUDIES					

Table D-23. Identified quality measures for psychiatric care in key quality measure databases: Outpatient followup

Quality of Care Concern	Type of SMI	Full Quality Measure	Developer	Evidence for Measure	Use of Measure
Outpatient visit	Schizophrenia	Proportion of patients discharged to an outpatient program	The Danish National Schizophrenia Registry	AHRQ Level B: Fair research evidence and supporting clinical consensus/ opinion A formal consensus procedure, involving experts in relevant clinical, methodological, public health and organizational sciences	Accreditation Care Coordination Collaborative inter-organizational quality improvement Decisionmaking by consumers about health plan/provider choice Decisionmaking by managers about resource allocation External oversight/Regional, county, or city agencies External oversight/State government program Internal quality improvement National reporting Quality of care research
Discharged to an outpatient program	Schizophrenia	Proportion of patients discharged to an outpatient program for whom an outpatients' visit is registered within 6 months of discharge	The Danish National Schizophrenia Registry	AHRQ Level B: Fair research evidence and supporting clinical consensus/ opinion A formal consensus procedure, involving experts in relevant clinical, methodological, public health and organizational sciences	Accreditation Collaborative inter-organizational quality improvement Decisionmaking by consumers about health plan/provider choice Decisionmaking by managers about resource allocation External oversight/Regional, county, or city agencies External oversight/State government program Internal quality improvement National reporting Quality of care research

Table D-23. Identified quality measures for psychiatric care in key quality measure databases: Outpatient followup (continued)

Quality of Care Concern	Type of SMI	Full Quality Measure	Developer	Evidence for Measure	Use of Measure
Followup within 7. 30 days of discharge	Hospitalization for mental illness	Followup after hospitalization for mental illness for those 6 years of age and older and who had an outpatient visit, an intensive outpatient encounter, or partial hospitalization with a mental health practitioner within • 7 days of discharge • 30 days of discharge. NOTE THIS NQF: 1937 **Not in use**, (Public Reporting, Quality Improvement with Benchmarking (external benchmarking to multiple organizations**)** The percentage of discharges for individuals 18 – 64 years of age who were hospitalized for treatment of schizophrenia and who had an outpatient visit, an intensive outpatient encounter or partial hospitalization with a mental health practitioner. Two rates are reported. • The percentage of individuals who received followup within 30 days of discharge The percentage of individuals who received followup within 7 days of discharge	NCQA **NQF ENDORSED** (0576) [HEDIS is for mental illness not just SMI]	A clinical practice guideline or other peer-reviewed synthesis of the clinical research evidence A formal consensus procedure, involving experts in relevant clinical, methodological, public health and organizational sciences	Accreditation Decisionmaking by businesses about health plan purchasing Decisionmaking by consumers about health plan/provider choice External oversight/Medicaid External oversight/Medicare External oversight/State government program Internal quality improvement
Discharged with outpatient visits	Schizophrenia	Discharged with outpatient visits	CQAIMH (Fischer and Owen)	AHRQ Level B: Fair research evidence and supporting clinical consensus/ opinion	NR

Table D-23. Identified quality measures for psychiatric care in key quality measure databases: Outpatient followup (continued)

Quality of Care Concern	Type of SMI	Full Quality Measure	Developer	Evidence for Measure	Use of Measure
Adjunctive psychosocial intervention	Bipolar Disorder	Percentage of patients with bipolar disorder who receive a recommendation for an adjunctive psychosocial intervention, including evidence-based therapies, within 12 weeks of initiating treatment	CQAIMH STABLE Project National Coordinating Council	A clinical practice guideline or other peer-reviewed synthesis of the clinical research evidence A formal consensus procedure, involving experts in relevant clinical, methodological, public health and organizational sciences One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal	Internal quality improvement

Table D-24. Quality measures used in studies for assessing psychiatric outcomes: Outpatient followup

Quality of Care Concern	Type of SMI	Full Quality Measure	User of Measure for Study	Data Source	Study Details
Followup after hospitalization	Psychiatric hospitalization for Mental illness	HEDIS: 7 day followup after discharge	Druss[15]	US HMO data	Using data from US HMOs participating in the HEDIS, analyzed the associate between five HEDIS measures of mental health performance, 2 of which are for followup after psychiatric hospitalization
Followup after hospitalization	Psychiatric hospitalization for Mental illness	HEDIS: 30 days followup after discharge	Druss[15]	US HMO data	Using data from US HMOs participating in the HEDIS, analyzed the associate between five HEDIS measures of mental health performance, 2 of which are for followup after psychiatric hospitalization
Followup after hospitalization	Psychiatric hospitalization for Mental Illness	Followup after hospitalization for mental illness	Lind[4]	New York Medicaid	Report on proposed future measure, stated that this measure is in current use in New York Medicaid system
Followup after hospitalization	Schizophrenia	Community followup after hospitalization within 1 to 7 days	Plever[16]	Queensland, Australia Mental Health Services	Study examined the lump sum payments tied to this quality indicator
Followup after hospitalization	Schizophrenia	Percentage of hospital separations for individuals with a diagnosis of schizophrenia who receive at least 1 psychiatry service or physician contact within 30 days of discharge	Addington[11]	NA	Development of a core set of performance measures for evaluating schizophrenia treatment services (36 essential measures)
Followup after hospitalization	Schizophrenia	Patients with schizophrenia discharged from the hospital who receive a followup visit within a specified time interval	Simon[5]	NA	Report on developing quality measures for Medicaid Beneficiaries with schizophrenia
Followup appointment after discharge	Psychosis	Followup appointment for mental illness scheduled within 7 days of discharge	Williams[6]	University Health System Consortium	Retrospective review of inpatient psychiatric records across member academic medical centers; performance measures adapted from consensus projects on important performance measures in mental health and clinical practice guidelines from organizations such as The Joint Commission, the National Quality Forum, and the American Psychiatric Association

Table D-24. Quality measures used in studies for assessing psychiatric outcomes: Outpatient followup (continued)

Quality of Care Concern	Type of SMI	Full Quality Measure	User of Measure for Study	Data Source	Study Details
Followup after no-show visit	Bipolar Disorder	Follow up with patient after a no-show visit (enhance treatment experience)	Kilbourne[13] used STABLE Project National Coordinating Council, RAND and APA measures	Veteran's Health Administration	Cross-sectional, cumulative data to 2 years prior to assessment
Assertive Community Treatment post hospitalization	Schizophrenia	Patients with schizophrenia who were recently discharged from an inpatient setting who receive ACT	Simon[5]	NA	Report on developing quality measures for Medicaid Beneficiaries with schizophrenia
Assertive Community Treatment	Schizophrenia, bipolar disorder	Beneficiaries with at least one ACT claim during the study period	Brown[10]	NA	Report on evidence-based practice for Medicaid beneficiaries with schizophrenia and bipolar disorder
Psychosocial treatment	Schizophrenia	Patients with schizophrenia who received psychosocial treatment during the measurement year	Simon[5]	NA	Report on developing quality measures for Medicaid Beneficiaries with schizophrenia
Evidence-based psycho-social treatment	Schizophrenia, bipolar disorder	Beneficiaries with at least one claim for psychotherapy, family therapy, supported employment or ACT during the study period	Brown[10]	NA	Report on evidence-based practice for Medicaid beneficiaries with schizophrenia and bipolar disorder
Any psychosocial service	Schizophrenia, bipolar disorder	Beneficiaries with at least one claim for and ambulatory mental health service other than evaluation, testing, or medication management during the study period	Brown[10]	NA	Report on evidence-based practice for Medicaid beneficiaries with schizophrenia and bipolar disorder
Combination of medication and Psychosocial treatment	Schizophrenia	Patients with schizophrenia receiving both medication and psychosocial treatment during the measurement year	Simon[5]	NA	Report on developing quality measures for Medicaid Beneficiaries with schizophrenia

Table D-25. Identified quality measures for psychiatric care in key quality measure databases: Care plans and continuity (treatment engagement)

Quality of Care Concern	Type of SMI	Full Quality Measure	Developer	Evidence for Measure	Use of Measure of Measure
Care plan created	Hospital-based inpatient psychiatric services (all ages but adults can be separated out)	Percentage of patients discharged from a hospital-based inpatient psychiatric setting with a continuing care plan created CMS: Post discharge continuing care plan created. Also added: "and contains all of the following: reason for hospitalization, principal discharge diagnosis, discharge medications and next level of care recommendations"	Joint Commission (Core Measure) **NQF ENDORSED** (0557) NQMC: 007528 HBIPS-6 HHS: 004858	A clinical practice guideline or other peer-reviewed synthesis of the clinical research evidence One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal	Accreditation Care Coordination Collaborative inter-organizational quality improvement Public reporting
Care plan provided to next level of care	Hospital-based inpatient psychiatric services (all ages but adults can be separated out)	Discharged from hospital-based psychiatric inpatient setting with a continuing care plan provided to the next level of care clinician or entity CMS: Post discharge continuing care plan transmitted to next level of care provider upon discharge	Joint Commission (Core Measure) **NQF ENDORSED** (0558) NQMC: 007529 HBIPS-7 HHS: 004857	A clinical practice guideline or other peer-reviewed synthesis of the clinical research evidence One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal	Accreditation Care coordination Collaborative inter-organizational quality improvement Internal quality improvement Public reporting
Second visit due to exacerbation	Schizophrenia	Patients with an exacerbation (no encounters in prior 90 days who received a second psychiatric service (outpatient visit with MD, or DO, or ARNP or PA, or inpatient visit or detox, observation/hold bed, residential, partial hospitalization	CQAIMH (Value Options)	AHRQ Level B: Fair research evidence and supporting clinical consensus/ opinion	NR
Terminated treatment by patient	Schizophrenia	Patients with one inpatient admission or two outpatient visits who terminated treatment or were lost to followup (cessation of patient-provider contact due to known or unknown causes, excluding patient death)	CQAIMH Popkin et al., 1998	AHRQ Level B: Fair research evidence and supporting clinical consensus/ opinion	NR

Table D-25. Identified quality measures for psychiatric care in key quality measure databases: Care plans and continuity (treatment engagement) (continued)

Quality of Care Concern	Type of SMI	Full Quality Measure	Developer	Evidence for Measure	Use of Measure of Measure
Outpatient visits assigned a primary care provider	Schizophrenia	Patients with one inpatient admission or two outpatient visits who were assigned a primary care provider	CQAIMH Popkin et al., 1998	AHRQ Level B: Fair research evidence and supporting clinical consensus/ opinion	NR
Enrolled in ACT	Schizophrenia	Patients with two or more inpatient stays or four emergency room crisis visits who are enrolled in a Program for Assertive Community Treatment	CQAIMH Developer: American Psychiatric Association	AHRQ Level A. Good research based evidence	NR
Relapse monitoring plan	Schizophrenia	Patients in stable phase and discontinued from antipsychotic with a relapse-monitoring plan designed for use in recognizing and responding to early signs of new episode	CQAIMH Developer: American Psychiatric Association	AHRQ Level B: Fair research evidence and supporting clinical consensus/ opinion	NR

Table D-26. Quality measures used in studies for assessing psychiatric outcomes: Care plans and continuity (treatment engagement)

Quality of Care Concern	Type of SMI	Full Quality Measure	User of Measure for Study	Data Source	Study Details
Notification to outpatient mental health provider	Psychosis	Notification of the patient's hospitalization to the outpatient mental health provider	Williams[6]	University Health System Consortium	Retrospective review of inpatient psychiatric records across member academic medical centers; performance measures adapted from consensus projects on important performance measures in mental health and clinical practice guidelines from organizations such as The Joint Commission, the National Quality Forum, and the American Psychiatric Association
Notification to outpatient mental health provider within 2 days of admission	Psychosis	Notification of the patient's hospitalization to the outpatient mental health provider within 2 days of admission	Williams[6]	University Health System Consortium	Retrospective review of inpatient psychiatric records across member academic medical centers; performance measures adapted from consensus projects on important performance measures in mental health and clinical practice guidelines from organizations such as The Joint Commission, the National Quality Forum, and the American Psychiatric Association
Notification to outpatient mental health provider or primary care provider to obtain information	Psychosis	Collaboration with the outpatient mental health provider and/or primary care physician in order to obtain information regarding the patient's past psychiatric and/or medical history to develop common treatment goals and discharge plans	Williams[6]	University Health System Consortium	Retrospective review of inpatient psychiatric records across member academic medical centers; performance measures adapted from consensus projects on important performance measures in mental health and clinical practice guidelines from organizations such as The Joint Commission, the National Quality Forum, and the American Psychiatric Association

Table D-26. Quality measures used in studies for assessing psychiatric outcomes: Care plans and continuity (treatment engagement) (continued)

Quality of Care Concern	Type of SMI	Full Quality Measure	User of Measure for Study	Data Source	Study Details
Notification to outpatient mental health provider or primary care provider within 2 days of admission	Psychosis	Collaboration with the outpatient mental health provider and/or primary care physician within 2 days of admission	Williams[6]	University Health System Consortium	Retrospective review of inpatient psychiatric records across member academic medical centers; performance measures adapted from consensus projects on important performance measures in mental health and clinical practice guidelines from organizations such as The Joint Commission, the National Quality Forum, and the American Psychiatric Association
Discharge plans to community health providers	Psychosis	Communication of discharge recommendations to the community health providers	Williams[6]	University Health System Consortium	Retrospective review of inpatient psychiatric records across member academic medical centers; performance measures adapted from consensus projects on important performance measures in mental health and clinical practice guidelines from organizations such as The Joint Commission, the National Quality Forum, and the American Psychiatric Association
Discharge from followup	Schizophrenia, paranoid and other psychoses, organic brain syndrome, or major affective disorder (meeting disability and duration criteria)	Proportion of people with SMI discharged from followup by specialist services	Charlwood[14]	NA	Report on the development and final recommendations for outcome indicators for severe mental illness for the UK from their National Centre for Health Outcomes Development

Table D-26. Quality measures used in studies for assessing psychiatric outcomes: Care plans and continuity (treatment engagement) (continued)

Quality of Care Concern	Type of SMI	Full Quality Measure	User of Measure for Study	Data Source	Study Details
Patient involvement in treatment	Psychosis	Patient involvement in treatment defined as documentation that included one or more of the following ways of participating in the treatment process: • Attendance and involvement in staffing • Patient identification of their problems • Patient identification of their goals for this hospitalization • Patient identification of their strengths and weaknesses • Patient identification of coping strategies • Patient indicating agreement with their treatment plan	Williams[6]	University Health System Consortium	Retrospective review of inpatient psychiatric records across member academic medical centers; performance measures adapted from consensus projects on important performance measures in mental health and clinical practice guidelines from organizations such as The Joint Commission, the National Quality Forum, and the American Psychiatric Association
Patient engagement in care	Inpatient or community mental health rehabilitation unit patients, mostly with schizophrenia	Degree of patients' influence and involvement in choice of medication and dose	Killaspy[1]	UK National Health Service Mental Health Trusts	Used a web-based toolkit (Quality Indicator for Rehabilitative Care [QuIRC]) reporting on seven domains of care, based on systematic review of effectiveness of components of care, a review of relevant international care standards and Delphi exercises with service users, practitioners, carers and advocates.
Healthy therapeutic alliance between patient and provider	Schizophrenia	Providers who work in partnership with patients and family members, offering help, treatment, and care in an atmosphere of hope and optimism (taking time to build a supportive and empathetic relationship with patients and family members)	Addington[11]	NA	Development of a core set of performance measures for evaluating schizophrenia treatment services (36 essential measures)

Table D-26. Quality measures used in studies for assessing psychiatric outcomes: Care plans and continuity (treatment engagement) (continued)

Quality of Care Concern	Type of SMI	Full Quality Measure	User of Measure for Study	Data Source	Study Details
Case management	Schizophrenia	Percentage of individuals assigned a case manager on admission to the schizophrenia treatment service	Addington[11]	NA	Development of a core set of performance measures for evaluating schizophrenia treatment services (36 essential measures)
Case management	Schizophrenia	Patients with schizophrenia who were recently discharged from an inpatient setting who received case management during the measurement year	Simon[5]	NA	Report on developing quality measures for Medicaid Beneficiaries with schizophrenia
Relapse Monitoring Plan	Bipolar Disorder	Percent of patients included in the study who are not on mood stabilizer medication but have mental health provider visits with a documented relapse monitoring plan	Watkins[3]	Veteran's Health Administration	Report on developing medical record-based performance indicators to measure the quality of mental health care
Case management for those with low-level functioning	Bipolar Disorder	Percent of patients included in the study with a GAF score ≤40 and 4 or more visits with a case manager during study period	Watkins[3]	Veteran's Health Administration	Report on developing medical record-based performance indicators to measure the quality of mental health care
Case management for those with low-level functioning	Schizophrenia	Percent of patients included in the study with a GAF score ≤40 visits with a case manager during study period	Watkins[3]	Veteran's Health Administration	Report on developing medical record-based performance indicators to measure the quality of mental health care

Table D-27. Identified quality measures for psychiatric care in key quality measure databases: Readmissions

Quality of Care Concern	Type of SMI	Full Quality Measure	Developer	Evidence for Measure	Use of Measure
Readmission rate	Schizophrenia, delusional and non-organic psychotic disorders; mood/ affective disorders; but also substance-related disorders; anxiety disorders; and selected disorders of adult personality and behavior	Risk adjusted percentage of individuals who had three or more episodes of care for a selected mental illness over all those who had at least one episode of care for a selected mental illness in general hospitals within a given year	Canadian Institute for Health Information	A clinical practice guideline or other peer-reviewed synthesis of the clinical research evidence A formal consensus procedure, involving experts in relevant clinical, methodological, public health and organizational sciences One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal	Internal quality improvement National health policymaking National reporting State/Provincial health policymaking
Readmission	Schizophrenia, delusional and non-organic psychotic disorders; mood/ affective disorders; but also substance-related disorders; anxiety disorders; and selected disorders of adult personality and behavior	Risk adjusted rate of readmission following discharge for a mental illness	Canadian Institute for Health Information	A clinical practice guideline or other peer-reviewed synthesis of the clinical research evidence A formal consensus procedure, involving experts in relevant clinical, methodological, public health and organizational sciences One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal	Decisionmaking by managers about resource allocation Internal quality improvement National health policymaking National reporting State/Provincial health policymaking

Table D-28. Quality measures used in studies for assessing psychiatric outcomes: Readmissions

Quality of Care Concern	Type of SMI	Full Quality Measure	User of Measure for Study	Data Source	Study Details
Readmission rates	Schizophrenia	Total number of acute-care psychiatric admissions among schizophrenia treatment service patients that occurred within 30 days of discharge divided by the total number of acute-care psychiatric discharges of schizophrenia treatment service patients per year.	Addington[11]	NA	Development of a core set of performance measures for evaluating schizophrenia treatment services (36 essential measures)
Readmission	Schizophrenia, paranoid and other psychoses, organic brain syndrome, or major affective disorder (meeting disability and duration criteria)	Hospital readmission frequencies for a resident population of people with SMI	Charlwood[14]	NA	Report on the development and final recommendations for outcome indicators for severe mental illness for the UK from their National Centre for Health Outcomes Development
Emergency Department psychiatric revisits	Severe and persistent mental illness	Psychiatric revisits to Emergency Department	Adams[17]	Local hospital Emergency Department	Based on the expectation that Readmission rates are to be one of the quality measures to be implemented, they implemented a quality improvement process in their Emergency Department to reduce psychiatric revisits. 80% of their hospital psychiatric admissions come through their Emergency Department. Their QI program decreased mean psychiatric emergency revisit rates.

Table D-29. Identified quality measures for psychiatric care in key quality measure databases: Inpatient stay characteristics

Quality of Care Concern	Type of SMI	Full Quality Measure	Developer	Evidence for Measure	Use of Measure
Rate of discharge	Schizophrenia, delusional and non-organic psychotic disorders; mood/ affective disorders; but also substance-related disorders; anxiety disorders; and selected disorders of adult personality and behavior	Age-standardized rate of separations from general hospitals through discharge or death following a hospitalization for a selected mental illness, per 100,000 population	Canadian Institute for Health Information	A clinical practice guideline or other peer-reviewed synthesis of the clinical research evidence A formal consensus procedure, involving experts in relevant clinical, methodological, public health and organizational sciences One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal	Monitoring and planning Monitoring health state(s) National health policymaking National reporting State/Provincial health policymaking
Days of hospitalization	Schizophrenia, delusional and non-organic psychotic disorders; mood/ affective disorders; but also substance-related disorders; anxiety disorders; and selected disorders of adult personality and behavior	Age-adjusted rate of total number of days in general hospitals for selected mental illness, per 10,000 population	Canadian Institute for Health Information	A clinical practice guideline or other peer-reviewed synthesis of the clinical research evidence A formal consensus procedure, involving experts in relevant clinical, methodological, public health and organizational sciences One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal	Monitoring and planning Monitoring health state(s) National health policymaking National reporting State/Provincial health policymaking

Table D-30. Quality measures used in Studies for assessing medical outcomes: Inpatient stay characteristics

Quality of Care Concern	Type of SMI	Full Quality Measure	User of Measure for Study	Data Source	Study Details
No studies??					

Table D-31. Identified quality measures for psychiatric care in key quality measure databases: Restraints

Quality of Care Concern	Type of SMI	Full Quality Measure	Developer	Evidence for Measure	Use of Measure
Seclusion	Hospital–based inpatient psychiatric services (all age groups but adults can be separated)	Total number of hours that all patients admitted to a hospital-based inpatient psychiatric setting were held in seclusion CMS: Hours of seclusion	Joint Commission **NQF ENDORSED** (0641) NGCM: 007525 HBIPS-3 HHS: 004854	One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal	Accreditation Collaborative inter-organizational quality improvement Internal quality improvement Public reporting
Physical restraint	Hospital-based inpatient psychiatric services (all age groups but adults can be separated)	Total number of hours that all patients admitted to a hospital-based inpatient psychiatric setting were maintained in physical restraint CMS: Hours of physical restraint use	Joint Commission **NQF ENDORSED (0640)** NGCM: 007525 HBIP-3 HHS: 004853	One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal	Accreditation Collaborative inter-organizational quality improvement Internal quality improvement Public reporting

Table D-32. Quality measures used in studies for assessing psychiatric outcomes: Restraints

Quality of Care Concern	Type of SMI	Full Quality Measure	User of Measure for Study	Data Source	Study Details
Restraint/ seclusion	Inpatient or community mental health rehabilitation unit patients, mostly with schizophrenia	Number of episodes of restraint/seclusion in past 3 months	Killaspy[1]	UK National Health Service Mental Health Trusts	Used a web-based toolkit (Quality Indicator for Rehabilitative Care [QuIRC]) reporting on seven domains of care, based on systematic review of effectiveness of components of care, a review of relevant international care standards and Delphi exercises with service users, practitioners, carers and advocates.

Table D-33. Identified quality measures for patient-centered care in key quality measure databases: Psychoeducation and psychotherapy

Quality of Care Concern	Type of SMI	Full Quality Measure	Developer	Evidence for Measure	Use of Measure
Psycho-education	Schizophrenia	Patients with either one inpatient admission or two outpatient visits who received education about their prescribed medications and side effects	CQAIMH Developer: Popkin et al 1998	AHRQ Level C. Little research evidence, principally based on clinical consensus/opinion	NR
Psycho-education	Schizophrenia	Proportion of incident (diagnosed within 12 months of contact) patients receiving psychoeducation via a manualized course within 2 years of discharge	The Danish National Schizophrenia Registry	A formal consensus procedure, involving experts in relevant clinical, methodological, public health and organizational sciences	Accreditation Collaborative inter-organizational quality improvement Decisionmaking by consumers about health plan/provider choice Decisionmaking by managers about resource allocation External oversight/Regional, county, or city agencies External oversight/State government program Internal quality improvement National reporting Quality of care research
Psycho-education	Bipolar Disorder	Percentage of patients diagnosed and treated for bipolar disorder who are provided with education and information about their illness and treatment within 12 weeks of initiating treatment	CQAIMH STABLE Project National Coordinating Council	A clinical practice guideline or other peer-reviewed synthesis of the clinical research evidence A formal consensus procedure, involving experts in relevant clinical, methodological, public health and organizational sciences One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal	Internal quality improvement

Table D-34. Quality measures used in Studies for assessing patient-centered outcomes: Psychoeducation and psychotherapy

Quality of Care Concern	Type of SMI	Full Quality Measure	Developer	Evidence for Measure	Use of Measure
Psycho-education	Schizophrenia	Percentage of patients formal education regarding psychosis (psychoeducation either in group or individually)	Addington[11]	NA	Development of a core set of performance measures for evaluating schizophrenia treatment services (36 essential measures)
Psycho-education approach	Inpatient or community mental health rehabilitation unit patients, mostly with schizophrenia	Whether unit uses written information/groups/expert talks to help with psychoeducation	Killaspy[1]	UK National Health Service Mental Health Trusts	Used a web-based toolkit (Quality Indicator for Rehabilitative Care [QuIRC]) reporting on seven domains of care, based on systematic review of effectiveness of components of care, a review of relevant international care standards and Delphi exercises with service users, practitioners, carers and advocates.
Individual Therapy	Schizophrenia	Individual therapy	Busch[2]	Medicaid Managed Behavioral Health Carve-Outs	Observational retrospective cohort study of ambulatory care Medicaid enrollees in carve-out and comparison regions
Group Therapy	Schizophrenia	Group therapy	Busch[2]	Medicaid Managed Behavioral Health Carve-Outs	Observational retrospective cohort study of ambulatory care Medicaid enrollees in carve-out and comparison regions
Psychotherapy	Schizophrenia, bipolar disorder	Beneficiaries with at least one psychotherapy claim during the study period	Brown[10]	NA	Report on evidence-based practice for Medicaid beneficiaries with schizophrenia and bipolar disorder

Table D-35. Identified quality measures for medical care in key quality measure databases: Diabetes and weight gain

Quality of Care Concern	Type of SMI	Full Quality Measure	Developer	Evidence for Measure	Use of Measure
Screening for diabetes	Bipolar Disorder	Percentage of patients diagnosed with bipolar disorder and treated with an atypical antipsychotic agent who receive at least one screening for hyperglycemia within the initial 16 weeks of treatment	CQAIMH STABLE Project National Coordinating Council **NQF ENDORSED** (0003)	A clinical practice guideline or other peer-reviewed synthesis of the clinical research evidence A formal consensus procedure, involving experts in relevant clinical, methodological, public health and organizational sciences One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal	Public Reporting Quality Improvement (Internal to the specific organization) Quality Improvement with Benchmarking (external benchmarking to multiple organizations) Internal Quality Improvement
Screening for diabetes	Schizophrenia, Bipolar Disorder	Diabetes screening for people with schizophrenia or bipolar disorder who are using antipsychotic medications: percentage of members 18 to 64 years of age with schizophrenia or bipolar disorder who were dispensed an antipsychotic medication and had a diabetes screening test during the measurement year.	NCQA NQMC– update pending CQAIMH STABLE Project National Coordinating Council **NQF ENDORSED** (1932) HEDIS	A formal consensus procedure, involving experts in relevant clinical, methodological, public health and organizational sciences One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal	Accreditation Decisionmaking by businesses about health plan purchasing Decisionmaking by consumers about health plan/provider choice External oversight/Medicaid External oversight/State government program Internal quality improvement

Table D-35. Identified quality measures for medical care in key quality measure databases: Diabetes and weight gain (continued)

Quality of Care Concern	Type of SMI	Full Quality Measure	Developer	Evidence for Measure	Use of Measure
Screening for hyperglycemia	Schizophrenia	Proportion of patients who have an increased blood glucose level	The Danish National Schizophrenia Registry	AHRQ Level B: Fair research evidence and supporting clinical consensus/ opinion A formal consensus procedure, involving experts in relevant clinical, methodological, public health and organizational sciences	Accreditation Collaborative inter-organizational quality improvement Decisionmaking by consumers about health plan/provider choice Decisionmaking by managers about resource allocation External oversight/Regional, county, or city agencies External oversight/State government program Internal quality improvement National reporting Quality of care research
Diabetes monitoring	Schizophrenia	Diabetes monitoring for people with diabetes and schizophrenia: percentage of members 18 to 64 years of age with schizophrenia and diabetes who had both an LDL-C test and an HbA1c test during the measurement year	NCQA NGCM- update pending **NQF ENDORSED** (1934) HEDIS		Consensus studies Accreditation Decisionmaking by businesses about health plan purchasing Decisionmaking by consumers about health plan/provider choice External oversight/Medicaid External oversight/State government program Internal quality improvement

Table D-35. Identified quality measures for medical care in key quality measure databases: Diabetes and weight gain (continued)

Quality of Care Concern	Type of SMI	Full Quality Measure	Developer	Evidence for Measure	Use of Measure
Screening for diabetes	Schizophrenia, bipolar or other psychoses	Percentage of patients aged 40 years or over with schizophrenia, bipolar affective disorder and other psychoses who have a record of blood glucose or HbA1c in the preceding 12 months	British Medical Association	A clinical practice guideline or other peer-reviewed synthesis of the clinical research evidence A formal consensus procedure, involving experts in relevant clinical, methodological, public health and organizational sciences One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal	Internal quality improvement National reporting Pay-for-performance
Screening for diabetes	Bipolar Disorder	Percentage of patients diagnosed with bipolar disorder and treated with an atypical antipsychotic agent who receive at least one screening for hyperglycemia within the initial 16 weeks of treatment	CQAIMH STABLE Project National Coordinating Council	A clinical practice guideline or other peer-reviewed synthesis of the clinical research evidence A formal consensus procedure, involving experts in relevant clinical, methodological, public health and organizational sciences One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal	Internal quality improvement

Table D-35. Identified quality measures for medical care in key quality measure databases: Diabetes and weight gain (continued)

Quality of Care Concern	Type of SMI	Full Quality Measure	Developer	Evidence for Measure	Use of Measure
Screening for weight gain	Schizophrenia, bipolar or other psychoses	Percentage of patients with schizophrenia, bipolar affective disorder and other psychoses who have a record of BMI in the preceding 12 months	British Medical Association	A clinical practice guideline or other peer-reviewed synthesis of the clinical research evidence A formal consensus procedure, involving experts in relevant clinical, methodological, public health and organizational sciences One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal	Internal quality improvement National reporting Pay-for-performance
Screening for weight gain	Schizophrenia	Proportion of patients who have an increased body mass index (BMI)	The Danish National Schizophrenia Registry	AHRQ Level B: Fair research evidence and supporting clinical consensus/ opinion A formal consensus procedure, involving experts in relevant clinical, methodological, public health and organizational sciences	Accreditation Collaborative inter-organizational quality improvement Decisionmaking by consumers about health plan/provider choice Decisionmaking by managers about resource allocation External oversight/Regional, county, or city agencies External oversight/State government program Internal quality improvement National reporting Quality of care research

Table D-35. Identified quality measures for medical care in key quality measure databases: Diabetes and weight gain (continued)

Quality of Care Concern	Type of SMI	Full Quality Measure	Developer	Evidence for Measure	Use of Measure
Screening for weight gain	Bipolar	Percentage of patients with bipolar disorder who were monitored for weight gain during initial 12 week period of treatment	CQAIMH STABLE Project National Coordinating Council	A clinical practice guideline or other peer-reviewed synthesis of the clinical research evidence A formal consensus procedure, involving experts in relevant clinical, methodological, public health and organizational sciences One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal	Internal quality improvement
Waist circumference	Schizophrenia	Proportion of patients who have an increased measure of abdominal waistline	The Danish National Schizophrenia Registry	AHRQ Level B: Fair research evidence and supporting clinical consensus/ opinion A formal consensus procedure, involving experts in relevant clinical, methodological, public health and organizational sciences	Accreditation Collaborative inter-organizational quality improvement Decisionmaking by consumers about health plan/provider choice Decisionmaking by managers about resource allocation External oversight/Regional, county, or city agencies External oversight/State government program Internal quality improvement National reporting Quality of care research

Table D-36. Quality measures used in studies for assessing medical outcomes: Diabetes and weight gain

Quality of Care Concern	Type of SMI	Full Quality Measure	User of Measure for Study	Data Source	Study Details
Blood glucose	Community psychiatric patients prescribed antipsychotics	All patients prescribed continuing antipsychotic medication should have their blood glucose (random or fasting sample, or HbA1c) measured at least once per year	Barnes[18]	UK National Health Service secondary care mental health Trusts	Baseline and one year followup audit against evidence based standards for metabolic syndrome
Blood glucose	Mental health disorders	Percentage of patients initiating a second generation antipsychotic with fasting glucose recorded 12 weeks and 6 months	Kilbourne[7]	NA	Framework for measuring quality and promoting accountability across silos: the case of mental disorder and co-occurring conditions
Diabetes screening	Schizophrenia, bipolar disorder	Beneficiaries with at least one claim during the study period for a glucose test	Brown[10]	NA	Report on evidence-based practice for Medicaid beneficiaries with schizophrenia and bipolar disorder
Eye and foot exams	Mental health disorders	Percentage of patients with diabetes who receive annual eye and foot exams	Kilbourne[7]	NA	Framework for measuring quality and promoting accountability across silos: the case of mental disorder and co-occurring conditions
Weight	Bipolar Disorder	Record weight	Kilbourne[13] used RAND measures	Veteran's Health Administration	Cross-sectional, cumulative data to 2 years prior to assessment
Weight gain	Bipolar Disorder	Monitor for weight gain	Kilbourne[13] used STABLE project and RAND measures	Veteran's Health Administration	Cross-sectional, cumulative data to 2 years prior to assessment
Weight assessment/ counseling	Schizophrenia	Patients with schizophrenia who have received a prescription for an antipsychotic medication, and who have evidence of weight assessment or counseling	Simon[5]	NA	Report on developing quality measures for Medicaid Beneficiaries with schizophrenia
BMI (or waist circumference)	Community psychiatric patients prescribed antipsychotics	All patients prescribed continuing antipsychotic medication should have their body mass index (or other measure of obesity such as waist circumference) measured at least once per year	Barnes[18]	UK National Health Service secondary care mental health Trusts	Baseline and one year followup audit against evidence based standards for metabolic syndrome

Table D-37. Identified quality measures for medical care in key quality measure databases: Hypertension

Quality of Care Concern	Type of SMI	Full Quality Measure	Developer	Evidence for Measure	Use of Measure
Blood pressure	Schizophrenia	Proportion of patients who have an increased blood pressure	The Danish National Schizophrenia Registry	A formal consensus procedure, involving experts in relevant clinical, methodological, public health and organizational sciences	Accreditation Collaborative inter-organizational quality improvement Decisionmaking by consumers about health plan/provider choice Decisionmaking by managers about resource allocation External oversight/Regional, county, or city agencies External oversight/State government program Internal quality improvement National reporting Quality of care research
Blood pressure	Schizophrenia, bipolar or other psychoses	Percentage of patients with schizophrenia, bipolar affective disorder and other psychoses who have a record of blood pressure in the preceding 12 months	British Medical Association	A clinical practice guideline or other peer-reviewed synthesis of the clinical research evidence A formal consensus procedure, involving experts in relevant clinical, methodological, public health and organizational sciences One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal	Internal quality improvement National reporting Pay-for-performance

Table D-37. Identified quality measures for medical care in key quality measure databases: Hypertension (continued)

Quality of Care Concern	Type of SMI	Full Quality Measure	Developer	Evidence for Measure	Use of Measure
Blood pressure	Bipolar Disorder	Blood pressure measurement	CQAIMH STABLE Project National Coordinating Council	A clinical practice guideline or other peer-reviewed synthesis of the clinical research evidence A formal consensus procedure, involving experts in relevant clinical, methodological, public health and organizational sciences One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal	Internal quality improvement

Table D-38. Quality measures used in studies for assessing medical outcomes: Hypertension

Quality of Care Concern	Type of SMI	Full Quality Measure	User of Measure for Study	Data Source	Study Details
Blood Pressure	Bipolar Disorder	Record blood pressure	Kilbourne[13] used RAND measures	Veteran's Health Administration	Cross-sectional, cumulative data to 2 years prior to assessment
Blood Pressure	Community psychiatric patients prescribed antipsychotics	All patients prescribed continuing antipsychotic medication should have their blood pressure measured at least once per year	Barnes[18]	UK National Health Service secondary care mental health Trusts	Baseline and one year followup audit against evidence based standards for metabolic syndrome
Blood pressure	Schizophrenia	Patients with schizophrenia who receive a blood pressure screening	Simon[5]	NA	Report on developing quality measures for Medicaid Beneficiaries with schizophrenia

Table D-39. Identified quality measures for medical care in key quality measure databases: Cardiovascular disease

Quality of Care Concern	Type of SMI	Full Quality Measure	Developer	Evidence for Measure	Use of Measure
LDL-C test for those with CVD	Schizophrenia	Cardiovascular monitoring for people with cardiovascular disease and schizophrenia: percentage of members 18 to 64 years of age with schizophrenia and cardiovascular disease who had an LDL-C test during the measurement year NQF: percentage of patients 18–64 years of age with schizophrenia and cardiovascular disease, who had an LDL-C test during the measurement year **NQF: 1927 Not in use**, Public Reporting, Quality Improvement (Internal to the specific organization) Percentage of individuals 25 to 64 years of age with schizophrenia or bipolar disorder who were prescribed any antipsychotic medication and who received a cardiovascular health **screenin**g during the measurement year	NCQA NQMC: Update pending **NQF ENDORSED** (1933) HEDIS	A formal consensus procedure, involving experts in relevant clinical, methodological, public health and organizational sciences One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal	Accreditation Decisionmaking by businesses about health plan purchasing Decisionmaking by consumers about health plan/provider choice External oversight/Medicaid External oversight/State government program Internal quality improvement NQF: NR
Lipid screening	Schizophrenia	Proportion of patients who have an increased level of blood lipids	The Danish National Schizophrenia Registry	AHRQ Level B: Fair research evidence and supporting clinical consensus/ opinion A formal consensus procedure, involving experts in relevant clinical, methodological, public health and organizational sciences	Accreditation Collaborative inter-organizational quality improvement Decisionmaking by consumers about health plan/provider choice Decisionmaking by managers about resource allocation External oversight/Regional, county, or city agencies External oversight/State government program Internal quality improvement National reporting Quality of care research

Table D-39. Identified quality measures for medical care in key quality measure databases: Cardiovascular disease (continued)

Quality of Care Concern	Type of SMI	Full Quality Measure	Developer	Evidence for Measure	Use of Measure
Lipid screening	Schizophrenia, bipolar or other psychoses	Percentage of patients aged 40 years or over with schizophrenia, bipolar affective disorder and other psychoses who have a record of total cholesterol: HDL ratio in the preceding 12 months	British Medical Association	A clinical practice guideline or other peer-reviewed synthesis of the clinical research evidence A formal consensus procedure, involving experts in relevant clinical, methodological, public health and organizational sciences One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal	Internal quality improvement National reporting Pay-for-performance
Lipid screening	Bipolar Disorder	Percentage of patients diagnosed with bipolar disorder and treated with an atypical antipsychotic agent who received at least one assessment for hyperlipidemia within the initial 16 week period of treatment	CQAIMH STABLE Project National Coordinating Council	A clinical practice guideline or other peer-reviewed synthesis of the clinical research evidence A formal consensus procedure, involving experts in relevant clinical, methodological, public health and organizational sciences One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal	Internal quality improvement
Screening for smoking	Bipolar, schizophrenia, bipolar affective disorder or other psychoses	Smoking status of those with coronary heart disease (CHD), stroke or transient ischemic attack (TIA), hypertension, diabetes, chronic obstructive pulmonary disease (COPD), chronic kidney disease (CKD), asthma	NQMC (WITHDRAWN)		

Table D-40. Quality measures used in Studies for assessing medical outcomes: Cardiovascular disease

Quality of Care Concern	Type of SMI	Full Quality Measure	User of Measure for Study	Data Source	Study Details
CVD risk screening	Mental health disorders	Percentage of patients with diabetes with documented CV risk factor assessment	Kilbourne[7]	NA	Framework for measuring quality and promoting accountability across silos: the case of mental disorder and co-occurring conditions
Metabolic screening	Schizophrenia, Bipolar Disorder	Annual assessment of weight/BMI, glycemic control, and lipids	Watkins[3]	Veteran's Health Administration	Report on developing medical record-based performance indicators to measure the quality of mental health care
Pulse	Bipolar Disorder	Record pulse	Kilbourne[13] used RAND measure	Veteran's Health Administration	Cross-sectional, cumulative data to 2 years prior to assessment
Lipids	Community psychiatric patients prescribed antipsychotics	All patients prescribed continuing antipsychotic medication should have their plasma lipids measured at least once per year	Barnes[18]	UK National Health Service secondary care mental health Trusts	Baseline and one year followup audit against evidence based standards for metabolic syndrome
Lipids	Mental health disorders	Percentage of patients initiating a second generation antipsychotic with lipids recorded 12 weeks and 6 months	Kilbourne[7]	NA	Framework for measuring quality and promoting accountability across silos: the case of mental disorder and co-occurring conditions
Lipids screening	Schizophrenia, bipolar disorder	Beneficiaries with at least one claim during the study period for a cholesterol test	Brown[10]	NA	Report on evidence-based practice for Medicaid beneficiaries with schizophrenia and bipolar disorder
Smoking cessation advice	Mental health disorders	Percentage of patients who smoke who are advised to quit	Kilbourne[7]	NA	Framework for measuring quality and promoting accountability across silos: the case of mental disorder and co-occurring conditions
Smoking cessation	Inpatient or community mental health rehabilitation unit patients, mostly with schizophrenia	Staff support to patients with smoking cessation	Killaspy[1]	UK National Health Service Mental Health Trusts	Used a web-based toolkit (Quality Indicator for Rehabilitative Care [QuIRC]) reporting on seven domains of care, based on systematic review of effectiveness of components of care, a review of relevant international care standards and Delphi exercises with service users, practitioners, carers and advocates.
Smoking cessation counseling	Schizophrenia	Patients with schizophrenia who are smokers who receive counseling about smoking in the measurement year	Simon[5]	NA	Report on developing quality measures for Medicaid Beneficiaries with schizophrenia

Table D-41. Identified quality measures for medical care in key quality measure databases: Other measures

Quality of Care Concern	Type of SMI	Full Quality Measure	Developer	Evidence for Measure	Use of Measure
Renal and thyroid tests	Schizophrenia, bipolar or other psychoses	Serum creatinine and TSH measurement for those on lithium therapy	British Medical Association	A clinical practice guideline or other peer-reviewed synthesis of the clinical research evidence A formal consensus procedure, involving experts in relevant clinical, methodological, public health and organizational sciences	Internal quality improvement National reporting Pay-for-performance
Cancer screening	Schizophrenia, bipolar or other psychoses	Percentage of women aged 25 years or over and who have not attained the age of 65 with schizophrenia, bipolar affective disorder and other psychoses whose notes record that a cervical screening test has been performed in the preceding 5 years	British Medical Association	A formal consensus procedure, involving experts in relevant clinical, methodological, public health and organizational sciences One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal	Internal quality improvement National reporting Pay-for-performance

Table D-42. Quality measures used in studies for assessing medical outcomes: Other

Quality of Care Concern	Type of SMI	Full Quality Measure	User of Measure for Study	Data Source	Study Details
Access to General Practitioner	Inpatient or community mental health rehabilitation unit patients, mostly with schizophrenia	Staff support to patients to access general practitioner	Killaspy[1]	UK National Health Service Mental Health Trusts	Used a web-based toolkit (Quality Indicator for Rehabilitative Care [QuIRC]) reporting on seven domains of care, based on systematic review of effectiveness of components of care, a review of relevant international care standards and Delphi exercises with service users, practitioners, carers and advocates.
Annual general health check-ups	Inpatient or community mental health rehabilitation unit patients, mostly with schizophrenia	Unit arranges/carries out annual general health check-ups	Killaspy[1]	UK National Health Service Mental Health Trusts	Used a web-based toolkit (Quality Indicator for Rehabilitative Care [QuIRC]) reporting on seven domains of care, based on systematic review of effectiveness of components of care, a review of relevant international care standards and Delphi exercises with service users, practitioners, carers and advocates.
General medical exam	Mental health disorders	Percentage of patients who have a general medical appointment annually	Kilbourne[7]	NA	Framework for measuring quality and promoting accountability across silos: the case of mental disorder and co-occurring conditions
General medical monitoring	Schizophrenia	Percentage of patients on antipsychotic medication who receive general medical monitoring at regular assessment intervals (weight, blood sugars, cholesterol) either by the program or by the family physician	Addington[11]	NA	Development of a core set of performance measures for evaluating schizophrenia treatment services (36 essential measures)
General medical monitoring	Schizophrenia	Patients who had an annual assessment of weight/BMI, glycemic control, and lipids	Watkins[3]	Veterans Health Administration	Report on developing medical record-based performance indicators to measure the quality of mental health care
Physical health maintenance	Schizophrenia, bipolar disorder	Beneficiaries with at least one claim during the study period for a comprehensive health examination or health behavior counseling	Brown[10]	NA	Report on evidence-based practice for Medicaid beneficiaries with schizophrenia and bipolar disorder
Dietary advice, accessing exercise, sexual health. dental care	Inpatient or community mental health rehabilitation unit patients, mostly with schizophrenia	Staff support to patients with dietary advice, accessing exercise, sexual health. dental care	Killaspy[1]	UK National Health Service Mental Health Trusts	Used a web-based toolkit (Quality Indicator for Rehabilitative Care [QuIRC]) reporting on seven domains of care, based on systematic review of effectiveness of components of care, a review of relevant international care standards and Delphi exercises with service users, practitioners, carers and advocates.

Table D-42. Quality measures used in studies for assessing medical outcomes: Other (continued)

Quality of Care Concern	Type of SMI	Full Quality Measure	User of Measure for Study	Data Source	Study Details
Non-psychiatric health care	Schizophrenia, paranoid and other psychoses, organic brain syndrome, or major affective disorder (meeting disability and duration criteria)	Use of non-psychiatric health care services by people with SMI	Charlwood[14]	NA	Report on the development and final recommendations for outcome indicators for severe mental illness for the UK from their National Centre for Health Outcomes Development
Physical health (including cancer)	Schizophrenia	Patients with schizophrenia who receive a blood pressure screening, flu shot, mammogram, pap smear, and colorectal cancer screening	Simon[5]	NA	Report on developing quality measures for Medicaid Beneficiaries with schizophrenia
Cancer screening	Schizophrenia, bipolar disorder	Beneficiaries with at least one claim for a mammogram, Pap smear, or colonoscopy during the study period	Brown[10]	NA	Report on evidence-based practice for Medicaid beneficiaries with schizophrenia and bipolar disorder
Metabolic conditions	Schizophrenia	Patients with schizophrenia who have a prescription for an antipsychotic medication who receive a screening for blood sugar, lipids, and/or blood pressure during the measurement year	Simon[5]	NA	Report on developing quality measures for Medicaid Beneficiaries with schizophrenia
Thyroid tests	Mental health disorders	Percentage of patients on lithium receiving thyroid tests	Kilbourne[7]	NA	Framework for measuring quality and promoting accountability across silos: the case of mental disorder and co-occurring conditions
Infectious disease screening	Schizophrenia	Patients with schizophrenia who receive a HIV, HBV, HCV, or other STD screening	Simon[5]	NA	Report on developing quality measures for Medicaid Beneficiaries with schizophrenia

Table D-43. Identified quality measures for patient-centered care in key quality measure databases: Employment

Quality of Care Concern	Type of SMI	Full Quality Measure	Developer	Evidence for Measure	Use of Measure
Employment assistance	Schizophrenia	Patients in active treatment who report that they are currently employed and have a prior work history or are actively looking for a job and have 1) participated in a program to help find a job or vocational rehabilitation is prescribed in treatment plan, or 2) report receiving assistance from an employment specialist	CQAIMH Lehman et al, 1998	Census	NOTE CAN NO LONGER FIND THIS ON CQAIMH WEB SITE

Table D-44. Quality measures used in studies for assessing patient-centered outcomes: Employment

Quality of Care Concern	Type of SMI	Full Quality Measure	User of Measure for Study	Data Source	Study Details
Supportive employment	Schizophrenia	People with schizophrenia who received or were offered supported employment during the measurement year	Simon[5]	NA	Report on developing quality measures for Medicaid Beneficiaries with schizophrenia
Supported employment	Schizophrenia, bipolar disorder	Beneficiaries with at least one supported employment claim during the study period	Brown[10]	NA	Report on evidence-based practice for Medicaid beneficiaries with schizophrenia and bipolar disorder

Table D-45. Identified quality measures for patient-centered care in key quality measure databases: Family involvement

Quality of Care Concern	Type of SMI	Full Quality Measure	Developer	Evidence for Measure	Use of Measure
Contact with family	Schizophrenia	Proportion of patients where relatives accept an offer of contact with the treatment system	The Danish National Schizophrenia Registry	A formal consensus procedure, involving experts in relevant clinical, methodological, public health and organizational sciences	Accreditation Collaborative inter-organizational quality improvement Decisionmaking by consumers about health plan/provider choice Decisionmaking by managers about resource allocation External oversight/Regional, county, or city agencies External oversight/State government program Internal quality improvement National reporting Quality of care research
Contact with family	Schizophrenia, schizoaffective disorder	Patients with a diagnosis for at least three months who had at least one visit with a psychiatrist and no more than 21 days in the hospital and who live either with family members or who have contact with them two or more times per week who had a family member's recent involvement in treatment (e.g. family meeting or phone contact with clinician	CQAIMH, Developer: Young et al, 1998	AHRQ Level C. Little research evidence, principally based on clinical consensus/opinion	NR

Table D-46. Quality measures used in studies for assessing patient-centered outcomes: Family involvement

Quality of Care Concern	Type of SMI	Full Quality Measure	User of Measure for Study	Data Source	Study Details
Contact with Family	Psychosis	Clinician contact with a family member and/or supportive other within 72 hours of admission	Williams[6]	University Health System Consortium	Retrospective review of inpatient psychiatric records across member academic medical centers; performance measures adapted from consensus projects on important performance measures in mental health and clinical practice guidelines from organizations such as The Joint Commission, the National Quality Forum, and the American Psychiatric Association
Family Involvement	Psychosis	Family involvement in treatment was defined as documentation that included one or more of the following ways of participating in the treatment process: • Attendance at family therapy sessions • Attendance at multiple family groups • Attendance at psycho-educational programs	Williams[6]	University Health System Consortium	Retrospective review of inpatient psychiatric records across member academic medical centers; performance measures adapted from consensus projects on important performance measures in mental health and clinical practice guidelines from organizations such as The Joint Commission, the National Quality Forum, and the American Psychiatric Association
Family Involvement	Inpatient or community mental health rehabilitation unit patients, mostly with schizophrenia	Number of families involved in patients/ residents care	Killaspy[1]	UK National Health Service Mental Health Trusts	Used a web-based toolkit (Quality Indicator for Rehabilitative Care [QuIRC]) reporting on seven domains of care, based on systematic review of effectiveness of components of care, a review of relevant international care standards and Delphi exercises with service users, practitioners, carers and advocates.
Family Involvement	Inpatient or community mental health rehabilitation unit patients, mostly with schizophrenia	Whether staff have meeting with patients and their families	Killaspy[1]	UK National Health Service Mental Health Trusts	Used a web-based toolkit (Quality Indicator for Rehabilitative Care [QuIRC]) reporting on seven domains of care, based on systematic review of effectiveness of components of care, a review of relevant international care standards and Delphi exercises with service users, practitioners, carers and advocates.

Table D-46. Quality measures used in studies for assessing patient-centered outcomes: Family involvement (continued)

Quality of Care Concern	Type of SMI	Full Quality Measure	User of Measure for Study	Data Source	Study Details
Family Involvement	Inpatient or community mental health rehabilitation unit patients, mostly with schizophrenia	Whether families invited to patients' care review meetings	Killaspy[1]	UK National Health Service Mental Health Trusts	Used a web-based toolkit (Quality Indicator for Rehabilitative Care [QuIRC]) reporting on seven domains of care, based on systematic review of effectiveness of components of care, a review of relevant international care standards and Delphi exercises with service users, practitioners, carers and advocates.
Family Therapy	Schizophrenia	Family therapy	Busch[2]	Medicaid Managed Behavioral Health Carve-Outs	Observational retrospective cohort study of ambulatory care Medicaid enrollees in carve-out and comparison regions
Family Therapy	Schizophrenia	Patients with schizophrenia who have a minimum number of visits for family therapy during the measurement year	Simon[5]	NA	Report on developing quality measures for Medicaid Beneficiaries with schizophrenia
Family therapy/ pscyho-education	Schizophrenia, bipolar disorder	Beneficiaries with at least one family therapy claim during the study period	Brown[10]	NA	Report on evidence-based practice for Medicaid beneficiaries with schizophrenia and bipolar disorder
Family Psycho-education	Inpatient or community mental health rehabilitation unit patients, mostly with schizophrenia	Number of families received psychoeducation in past 12 months	Killaspy[1]	UK National Health Service Mental Health Trusts	Used a web-based toolkit (Quality Indicator for Rehabilitative Care [QuIRC]) reporting on seven domains of care, based on systematic review of effectiveness of components of care, a review of relevant international care standards and Delphi exercises with service users, practitioners, carers and advocates.
Family Psycho-education	Schizophrenia	Percentage of family members who receive formal education regarding psychosis (the course of family intervention should be longer than 6 months with more than 10 planned sessions	Addington[11]	NA	Development of a core set of performance measures for evaluating schizophrenia treatment services (36 essential measures)

Table D-47. Identified quality measures for patient-centered care in key quality measure databases: Other measures

Quality of Care Concern	Type of SMI	Full Quality Measure	Developer	Evidence for Measure	Use of Measure
Comprehensive care plan agreement	Schizophrenia, bipolar or other psychoses	Comprehensive Care Plan, agreed between individuals, their family and/or carers as appropriate	British Medical Association	A clinical practice guideline or other peer-reviewed synthesis of the clinical research evidence A formal consensus procedure, involving experts in relevant clinical, methodological, public health and organizational sciences One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal	Internal quality improvement National reporting Pay-for-performance
Social Support	Schizophrenia	Proportion of incident (diagnosed within 12 months of contact) patients for which need for social support has been assessed by a medical social worker	The Danish National Schizophrenia Registry	AHRQ Level B: Fair research evidence and supporting clinical consensus/ opinion A formal consensus procedure, involving experts in relevant clinical, methodological, public health and organizational sciences	Accreditation Collaborative inter-organizational quality improvement Decisionmaking by consumers about health plan/provider choice Decisionmaking by managers about resource allocation External oversight/Regional, county, or city agencies External oversight/State government program Internal quality improvement National reporting Quality of care research

Table D-48. Quality measures used in studies for assessing patient-centered outcomes: Other measures

Quality of Care Concern	Type of SMI	Full Quality Measure	User of Measure for Study	Data Source	Study Details
Autonomy	Inpatient or community mental health rehabilitation unit patients, mostly with schizophrenia	Patients decide:: what time they want to wake up/have meals/go to bed/how they spend their money/time off the unit/how many cigarettes and alcohol they consume/whether they stay overnight elsewhere/have a consensual sexual relationship	Killaspy[1]	UK National Health Service Mental Health Trusts	Used a web-based toolkit (Quality Indicator for Rehabilitative Care [QuIRC]) reporting on seven domains of care, based on systematic review of effectiveness of components of care, a review of relevant international care standards and Delphi exercises with service users, practitioners, carers and advocates.
Patient's involvement in choice of medication and dose	Inpatient or community mental health rehabilitation unit patients, mostly with schizophrenia	Degree of patients' influence and involvement in choice of medication and dose	Killaspsy[1]	UK National Health Service Mental Health Trusts	Used a web-based toolkit (Quality Indicator for Rehabilitative Care [QuIRC]) reporting on seven domains of care, based on systematic review of effectiveness of components of care, a review of relevant international care standards and Delphi exercises with service users, practitioners, carers and advocates.
Satisfaction with mental health care	Schizophrenia, paranoid and other psychoses, organic brain syndrome, or major affective disorder (meeting disability and duration criteria)	User satisfaction with respect to a specific mental health service, among people with SMI	Charlwood[14]	NA	Report on the development and final recommendations for outcome indicators for severe mental illness for the UK from their National Centre for Health Outcomes Development
Quality of Life	Schizophrenia	Percentage of patients receiving an assessment of quality of life at intake (as measured on a structured scale)	Addington[11]	NA	Development of a core set of performance measures for evaluating schizophrenia treatment services (36 essential measures)
Quality of Life	Schizophrenia, paranoid and other psychoses, organic brain syndrome, or major affective disorder (meeting disability and duration criteria)	User-assess health-related quality of life for a service-provider population of people with SMI	Charlwood[14]	NA	Report on the development and final recommendations for outcome indicators for severe mental illness for the UK from their National Centre for Health Outcomes Development

Table D-48. Quality measures used in studies for assessing patient-centered outcomes: Other measures (continued)

Quality of Care Concern	Type of SMI	Full Quality Measure	User of Measure for Study	Data Source	Study Details
Independent Living Skills	Schizophrenia	Percentage of patients receiving an assessment of independent living skills	Addington[11]	NA	Development of a core set of performance measures for evaluating schizophrenia treatment services (36 essential measures)
Social Skills Training	Schizophrenia	Patients receiving during the study period any social skills training (and how many visits)	Watkins[3]	Veterans Health Administration	Report on developing medical record-based performance indicators to measure the quality of mental health care
Housing status	Schizophrenia, paranoid and other psychoses, organic brain syndrome, or major affective disorder (meeting disability and duration criteria)	Accommodation status of people with SMI	Charlwood[14]	NA	Report on the development and final recommendations for outcome indicators for severe mental illness for the UK from their National Centre for Health Outcomes Development

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